

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE	PAGE OF PAGES 1 of 1
2. AMENDMENT/MODIFICATION NO. <div style="text-align: center;">3</div>	3. EFFECTIVE DATE <div style="text-align: center;">7-Jun-2002</div>	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. <i>(If applicable)</i>	
6. ISSUED BY US Army Corps of Engineers, Kansas City District 760 Federal Building, 601 East 12th Street Kansas City, Missouri 64106-2896		7. ADMINISTERED BY <i>(If other than item 6)</i>		
8. NAME AND ADDRESS OF CONTRACTOR <i>(No., street, county, State and ZIP Code)</i>		(X) 9a. AMENDMENT OF SOLICITATION NO. X DACA41-02-R-0001 9b. DATED <i>(SEE ITEM 11)</i> 5/13/2002 10a. MODIFICATION OF CONTRACT/ORDER NO. 10b. DATED <i>(SEE ITEM 13)</i>		
CODE FACILITY CODE		11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS		
<input checked="" type="checkbox"/> The above number solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers <input type="checkbox"/> is extended, <input checked="" type="checkbox"/> is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegraph which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.				
12. ACCOUNTING AND APPROPRIATION DATA <i>(If required)</i>				

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.	
(X)	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: <i>(Specify authority)</i> THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBER CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES <i>(such as changes in paying office, appropriation date, etc.)</i> SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF:
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER <i>(Specify type of modification and authority)</i>

E. IMPORTANT: Contractor ☐ is not, ☐ is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION <div style="text-align: center;">Design-Build Contract for West Gate Access Road Fort Leonard Wood, Missouri</div>	<i>(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)</i>
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The Solicitation is amended in accordance with the attached pages.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER <i>(Type or print)</i>	16A. NAME AND TITLE OF CONTRACTING OFFICER <i>(Type or print)</i>		
15B. CONTRACTOR/OFFEROR <div style="text-align: center;">_____ <i>(Signature of person authorized to sign)</i></div>	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY <div style="text-align: center;">_____ <i>(Signature of Contracting Officer)</i></div>	16C. DATE SIGNED

The SOLICITATION is amended as follows:

1. SPECIFICATIONS:

- a. Revised Pages: The following pages are deleted and replaced with revised pages of the same numbers.

00110-4
00120-3

- b. Revised Sections: The following sections are deleted and replaced with revised pages of the same numbers.

00010
01012
01015
01500
01780
Appendix F

2. Offerors shall use the revised Proposal Schedule for submission of proposals.

3. For convenience, on the revised specification pages, essential changes have been emphasized by underlining lines or paragraphs changed from the previous issue. However, all portions of the revised specification pages shall apply whether or not changes have been indicated.

4. Offerors are required to acknowledge receipt of this amendment on the Bidding Form, in the space provided, or by separate letter or telegram prior to opening of bids. Failure to acknowledge all amendments may cause rejection of the proposal.

5. Proposals will be received until 2:00 p.m., local time, 20 June 2002, in Room 760 Federal Building, 601 E. 12th Street, Kansas City, Missouri 64106-2896.

SECTION 00010 Solicitation Contract Form

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0001	West Gate Access Road Design FFP - All cost to provide all design-related services to complete the documentation as required by the Scope of Work. Design related services include <u>all required</u> engineering, design surveys, design quality control and quality assurance and plans/specifications deliverables.	1.00	Lump Sum		
NET AMT					<hr/>

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0002	West Gate Access Road FFP - All other costs, exclusive of design-related costs required to complete the construction of the West Gate Access Road as required by the Scope of Work. These costs include, but are not limited to, construction surveys, earthwork, roadway paving, signing, delineation, lighting, bridges, drainage structures, <u>environmental, quality control and contract administration.</u>	1.00	Lump Sum		
NET AMT					<hr/>

INDICATE ONE: _____
 Asphalt Concrete

OPTION SCHEDULE

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0003	Project Paving Bonus or Deduct FFP – The \$200,000 is an amount that is established as maximum amount of bonus that will be paid on the project. The bonus or deduct will be paid for under the pavement smoothness and Superpave bonus or deduct criteria as defined in the Missouri Department of Transportation Standard Specifications for Highway Construction and Job Special Provisions. Driving Lane Paving Unit Price for Bonus or Deduct Calculation: \$40/ton for Superpave Asphalt \$36/square yard for Concrete				
NET AMT					<u>\$200,000.00 NTE</u>

CLAUSES INCORPORATED BY FULL TEXT

FIELD OFFICE OVERHEAD

NOTICE TO BIDDERS: For your bid to be responsive, you must declare below the single accounting practice that you apply to contracts to calculate field office overhead for all change orders, modifications and requests for equitable adjustment. Pursuant to Federal Acquisition Regulations (FAR) Parts 31.105(d)(3) and 31.203(d)(1), an accounting practice that varies from modification to modification is not allowable. Select one of the following:

1. TIME DISTRIBUTION BASE FOR A PER DIEM RATE

If you use this practice, see Special Clause "Field Office Overhead Per Diem Rate" _____

2. DIRECT COST DISTRIBUTION BASE FOR A PERCENTAGE MARKUP

If you use this practice, see Special Clause "Field Office
Overhead Percentage Markup" _____

**3. OTHER ACCOUNTING PRACTICE THAT IS ALLOWABLE
UNDER THE FAR AND THAT USES A SINGLE DISTRIBUTION BASE.** _____

YOU MUST DESCRIBE THE ACCOUNTING PRACTICE IN SUFFICIENT DETAIL BELOW TO ALLOW THE CONTRACTING OFFICER TO DETERMINE WHAT ACCOUNTING PRACTICE IS BEING UTILIZED BY YOUR COMPANY AND THAT IT COMPLIES WITH THE FAR.

FAILURE TO FULLY COMPLY WITH THE ABOVE REQUIREMENT OR, IF ALTERNATIVE 3 IS DECLARED AND YOUR DESCRIPTION DOES NOT CLEARLY STATE OR DESCRIBE A CONSISTENT ACCOUNTING PRACTICE USING A SINGLE DISTRIBUTION BASE, WILL BE CAUSE FOR YOUR BID TO BE REJECTED AS NON-RESPONSIVE.

NOTES:

1. Proposal prices must be entered for all items of the Proposal Schedule. Award will be made as a whole to one Contractor on the basis of price and other factors. Offeror's attention is directed to SECTION 00120 PROPOSAL EVALUATION AND CONTRACT AWARD for further details.
2. If a modification to an offer is submitted which provides for a lump sum adjustment to the total cost, the application of the lump sum adjustment to each price in the Proposal Schedule must be stated. If it is not stated, the offeror agrees that the lump sum adjustment shall be applied on a pro rata basis to every price in the Proposal Schedule.
3. Offeror's attention is directed to SECTION 00100, paragraph titled "Arithmetic Discrepancies" wherein in are procedures for correction of errors.
4. Offeror's attention is directed to SECTION 01100 GENERAL for special provisions pertaining to this Solicitation.
5. Offeror's attention is directed to SECTION 01100, paragraph titled "Missouri Sales and Use Tax".
6. The general outline of the principal features of each item as listed does not in any way limit the responsibility of the offeror for making a thorough investigation of the drawings and specifications to determine the scope of work included in each item.
7. Offeror's attention is directed to the CONTRACT CLAUSE wherein the apparent low offeror is required to submit a small business and small disadvantaged business subcontracting plan. The subcontracting plan must meet the requirements listed and may be submitted in the format that appears at the end of SECTION 00100. Submission of the plan is required prior to award. Award will not be made under this solicitation before the Contracting Officer approves the plan.

8. Determination of the Offeror's total price for the proposed work will be based on the TOTAL of the BASE SCHEDULE. Initial award will be made of the BASE SCHEDULE. The OPTION SCHEDULE includes the Project Paving Bonus or Deduct. The final amount of the Paving Bonus or deduct will be determined in accordance with the Missouri Department of Transportation Standard Specifications. The option for the project paving bonus or deduct will be exercised as soon as practicable after the profilograph testing is completed and verified but in no event after final payment is made. [For surface test information see sections 403.20 (Asphalt) and 502.14 (Concrete). For bonus or deduct calculations see 403.24.4 (Asphalt) and 502.19.5 (Concrete). For Superpave pay factors for density, asphalt content, VMA and air voids see Job Special Provision MSP-96-01V, Bituminous Mixture AC/AQ.] The unit prices shown in item no 0003 of the Solicitation Contract Form will be used to determine the amount of project paving bonus or deduct according to the pay factors outlined in the referenced MoDOT Specifications.
9. Offeror's attention is directed to the CONTRACT CLAUSES, FAR 52.223-9, Certification and Estimate of Percentage of Recovered Material Content for EPA-Designated Items. Certification will be required upon contract completion unless the Contracting Officer has approved a waiver. The waiver must be approved prior to contract award.
10. The Government will procure this project through a Best Value competitive acquisition in accordance with the provisions set forth in the Request for Proposal (RFP).
11. At the issuance of this RFP, the Government has limited funding available. The contract will be awarded after the Government receives sufficient fund to award the total of the base schedule line items. Reference is made to Section 00700, Contract Clauses, 52.232-18, Availability of Funds.

Customer Satisfaction. Reviews how satisfied prior customers and end users are with the offeror's completed work. Includes the willingness of prior customers to do business with the offeror again if given the choice.

Timeliness of Performance. Reviews how well the contractor has adhered to contract schedules.

Extent of subcontracting to small businesses, small disadvantaged businesses, and women-owned businesses.

FACTOR 2. Experience. Provide in detail the experience of your organization in contracts of similar type and complexity, including a list of contracts relevant to the proposed contract, which your organization has completed within the last six years, or which are currently under contract and more than 50% complete. Provide the project name, a short description, the size, the owner's name and telephone number, the date of completion and the percentage of the project accomplished with your own forces. Information regarding the type and extent of work completed under the contract shall be included. For this factor, a project of similar type, size and complexity is considered to be one that contains similar work items, schedule constraints and/or project delivery method.

The Government will evaluate the following subfactors:

Design-Build Roadway Experience

Major Grading, Drainage, Paving and Bridge Experience

FACTOR 3. Pavement Design. Provide a detailed plan that describes how the pavement design will meet the requirements of the Scope of Work in the contract provisions. The plan shall describe how the offeror will address the performance parameters of subgrade, pavement structure and design life. The Government will evaluate the following subfactors:

Site Investigation – Reviews how well the offeror has identified appropriate and validated technology for the characterization of subgrade soils.

Pavement Structure -- Reviews how well the offeror's design methodology combines subgrade underdrainage, base and pavement.

Design Life – Reviews how well the offeror's methodology ensures that design life parameters are met and long-term performance is not jeopardized.

FACTOR 4. Schedule. Provide a schedule detailing major items of work not to exceed twenty separate items in a bar chart that illustrate the offeror's plan to design and construct the project within the time constraints provided in the contract. The Government will evaluate the following subfactors:

Overall Schedule – Reviews how well the offeror meets or improves upon the length of time provided in the proposal documents and identifies the milestones for design and construction.

Incorporation of Quality Control Procedures – Reviews how well the offeror builds time into the schedule for quality control reviews of design and construction submittals.

FACTOR 5. Personnel Qualifications. Identify key personnel that will be involved in the design, construction, QC/QA and management of the project. For each key personnel describe his/her function and responsibility to the project. Provide the name of a principle or officer of the offeror that will be in overall charge of the project. Provide resumes for each listed individual.

FACTOR 6. Price. Offerors shall submit the Proposal Schedule, as found in Section 00010. The Proposal schedule will be evaluated in accordance with paragraphs: BASIS FOR AWARD, EVALUATION FACTORS, and PRICE listed below.

The RFP allows an offeror to propose either asphaltic concrete or Portland cement concrete pavement for the pavement design. In order to take into account increased life cycle costs for asphaltic concrete pavement versus Portland cement concrete pavement, the price evaluation team will add \$1,250,000 to your proposed cost for Bid Schedule Item 0002, if your pavement design proposal is for use of asphaltic concrete pavement. Therefore, it is critical that you indicate in the designated area under the Base Schedule Item No. 0002 whether your proposed pavement design is asphalt or concrete.

Do not include the above \$1,250,000 in your price proposal. The \$1,250,000 is added for only the purpose of this evaluation and will not be used in the award amount.

d. ADDITIONAL INFORMATION TO BE PROVIDED IN VOLUME 2:

Factor 2 is equal to Factor 3. Factors 2 and 3 are slightly less important than Factor 1. Within Factor 2 and 3, the subfactors are equal in importance to one another.

Factor 4 is less important than Factors 2 and 3. Within Factor 4, subfactor a is most important and subfactor b is less important than subfactor a.

Factor 5 is the least important of all the technical factors.

Factor 6 (Price) is equal in importance to Factors 1, 2, 3, 4, and 5 combined.

5. RISK

a. Proposal Risk. Proposal risk will evaluate the risks associated with an offeror's proposed approach for accomplishing the RFP requirements. Proposal risk will be evaluated in conjunction with assessing the merit of the proposal.

b. Performance Risk. Performance risk analysis will be used to provide insight into an offeror's probability of successfully completing the solicitation requirements based on the offeror's performance record on similar contract efforts. Performance risks are those risks that are associated with an offeror's likelihood of success in performing the requirements stated in the solicitation. This risk will be assessed through evaluation of the offeror's past performance.

6. PRICE

a. Price will not be point-scored, but will be subjectively evaluated. The specific evaluation process is described below. The technical evaluation factors, when combined, are equal to price. The closer the total evaluated technical ratings of acceptable offers are to one another, the greater will be the importance of the total evaluated technical ratings in making the selection determination.

b. The Price Proposal Schedule (Volume 2) submitted in response to this solicitation will not be point scored but will be subjectively evaluated for reasonableness over the life of the contract. In evaluation of life cycle cost for comparison in the use of asphaltic concrete pavement versus Portland cement concrete pavement, the price evaluation team will add \$1,250,000 to your proposal cost for Bid Schedule Item 0002, if your pavement design proposal is for the use of asphaltic concrete pavement. In the event, during the course of the analysis, the Price Evaluation Team has reason to question the reasonableness of a price proposal, or has reason to believe there is unbalancing in the price proposal, the PET may conduct such additional reasonable analysis as it requires in order to complete a thorough price analysis. Because the evaluation of the price proposal will represent a portion of the total evaluation, it is possible that an offeror might not be selected because of an unbalanced or an unreasonable price proposal.

c. The evaluated price information will be reported to the SSA and SSAC. The SSA and SSAC will utilize the technical ratings and the price evaluations in preparing its overall ranking of the proposals and as to the Best Value determination for selection of successful offeror.

7. PERFORMANCE

In the course of evaluating offerors' proposals, the Source Selection Evaluation Board may contact references submitted by the offeror. The SSEB may also check past performance information obtained from sources other than those identified by the offeror. All gathered information will be used to evaluate the offeror's overall past performance.

Sheer numbers of confirmed negative comments may not give the offeror an overall rating of less than satisfactory. Negative comments in areas that are not relevant to the successful performance of this contract may not result in a rating of less than satisfactory. Conversely, one or only a few negative confirmed comments in

SECTION 01012 – DESIGN AFTER AWARD

1.0 General

The contractor shall schedule the number and composition of the design submittal phases. Design submittals are required at the preliminary (50%) and final (95%) design stages and at the 100% design complete stage. The requirements of each design stage are listed hereinafter. The contractor shall reflect the number and contents of the design submittals phases in the progress charts. As a maximum, the 50%, 95% and 100% complete design submittals shall be made in only one package for each of the four (4) major categories listed in Paragraph, "Contents of Design Submittals," except the foundation design and long lead item submittals. These exceptions may be in addition to the 4 major submittals. More than one category may be combined in a submittal.

2.0 Designer of Record

The contractor shall identify, for approval, the Designer of Record for each area of work. One designer of record may be responsible for more than one area. All areas of design disciplines shall be accounted for by a listed, registered Designer of Record. The Designer(s) of Record shall stamp, sign, and date all design drawings under their responsible discipline at each design submittal stage (see SCR – "Registration of Designers").

3.0 Stages of Design Submittals

3.1 Preliminary Conformance Review Submittal (50%)

The review of this submittal is primarily to insure that the contract documents and design analysis are proceeding in a timely manner and that the design criteria is being correctly interpreted. The submittal shall consist of the following:

1. Design analysis, developed to 50%
2. 50% Complete drawings
3. CADD files of all drawings (2 copies)

Environmental permits, as required. When environmental permits are not required, the contractor shall provide a statement with justification to that effect.

3.2 Final Design Review Submittal (95%)

The review of this submittal is to insure that the design is in accordance with directions provided the Contractor during the design process. The Contractor shall submit the following documents for Final Design Review:

1. Design Analysis, developed to 95%
2. 95% complete drawings
3. Draft Specifications
4. Annotated 50% review comments

The Design Analysis submitted for Final Design Review shall be in its final form. The Design Analysis shall include all backup material previously submitted and revised as necessary. All design calculations shall be included. The Design Analysis shall contain all explanatory material giving the design rationale for any design decisions, which would not be obvious to an engineer reviewing the Final Drawings and Specifications.

The Contract Drawings submitted for Final Design Review shall include the drawings previously submitted which have been revised and completed as necessary. The Contractor is expected to have completed all of his coordination checks and have the drawings in a design complete condition. The drawings shall be complete at this time including the incorporation of any design review comments generated by the Preliminary design review. The drawings shall contain all the details necessary to assure a clear understanding of the work throughout construction. Shop drawings will not be considered as design drawings. All design shall be shown on design drawings prior to submittal of shop drawings.

The Draft Specifications on all items of work submitted for Final Design Review shall consist of legible marked-up specification sections.

The Contractor may begin construction on portions of the work for which the Government has reviewed the Final Design Submission and has determined satisfactory for purposes of beginning construction. The ACO or COR will notify the Contractor when the design is cleared for construction. The Government will not grant any time extension for any design resubmittal required when, in the opinion of the ACO or COR, the initial submission failed to meet the minimum quality requirements as set forth in the Contract.

3.3 Design Complete Submittal

After the Final Design Review, the Contractor shall revise the Contract Documents by incorporating any comments generated during the Final Design Review and shall prepare final hard copy Contract Specifications. The Contractor shall submit the following documents for the design complete submittal:

1. Design analysis, in final 100% complete form
2. 100% complete drawings
3. Final specifications
4. Annotated 95% review comments
5. CADD files of all drawings (2 copies)

The Contractor shall submit the Design Complete Submittal not later than 30 calendar days after the Government returns the annotated Final Conformance Review Submittal.

If the Government allows the Contractor to proceed with limited construction based on pending minor revisions to the reviewed Final Design submission, no payment will be made for any in-place construction related to the pending revisions until they are completed, resubmitted with the Design Complete Submittal and are satisfactory to the Government.

3.4 Start Construction Activity Clearing and Grubbing Prior to Submission of Design Submittals

The purpose of this start prior to submission of design stage submittals is to allow the Contractor to meet the window of November 15, 2002, through March 30, 2003, regarding clearing of bat roost trees (See Section 01015, paragraph 2.0.B). Immediately after the issuance of Contract Notice to Proceed, and within the time period of the above window, the Contractor will be allowed to start clearing and grubbing operation for the construction of the Contractor's design of the project. The Contractor's clearing and grubbing operation shall include all areas the Contractor will disturb for construction of this project.

3.4.1 In order to allow this immediate start, the Contractor shall submit to the Contracting Officer for review its design horizontal and vertical alignments with clearing limits 10 calendar

days before start of clearing and grubbing operations. This submission of the horizontal and vertical alignments with clearing limits are separate from the 50%, 95% and 100% design stage submissions. However, these limits shall also be submitted with any of the design stages, if necessary, to provide a complete submission.

3.4.2 The contract requires that the Contractor submit for approval a Safety Plan, Environmental Plan and Contractor's Quality Control Plan, prior to start of construction. To allow the above start of clearing and grubbing, the Contractor shall submit for approval an interim Safety Plan, Environmental Plan and Contractor's Quality Control Plan for the clearing and grubbing activity. These interim plans shall be submitted 10 days before start of clearing and grubbing operations.

3.4.3 If the Contractor does not complete its clearing and grubbing operation by March 30, 2003, then it shall at a minimum have felled all bat roost trees within its clearing and grubbing limits and all other areas that will be disturbed. In the event the Contractor determines that it will not complete the clearing and grubbing operation by March 30, 2003, and have to fell bat roost trees to meet the minimum, then the Contractor is responsible for obtaining the expertise necessary for identification of bat roost trees and fell these bat roost trees by March 30, 2003. The objective is to have felled all bat roost trees that are located within the areas the Contractor will need to clear and grub for completion of the project. In the event the Contractor fails to fell all bat roost trees within the time described above, and such failure causes delay or suspension of the project, then such failure is at the fault of the Contractor and not the fault of the Government.

4.0 Quality of Design Submittals

4.1 General

The quality control and quality assurance procedures for each type of Design Document and Construction Document shall be organized by engineering discipline (such as structural, civil and utilities). These procedures shall specify measures to be taken by the Design-BUILDER (1) to ensure that appropriate quality standards are specified and included in the Design Documents and Construction Documents and to control deviations from such standards, it being understood and agreed that no deviations from such standards shall be made unless they have been previously approved by USACE at USACE's sole discretion, and (2) for the selection of suitability of materials, and elements of the Work that are included in the Project.

The Design QC/QA Plan shall include the following:

Quality control and quality assurance procedures for preparing and checking all plans, calculations, drawings and other items submitted, to ensure that they are independently checked and back-checked in accordance with generally accepted architectural and engineering practices, by experienced architects and engineers, respectively. The originator, checker and back-checker shall be clearly identified on the face of all submittals. Specific procedures for verifying computer programs used shall also be included. Plans, reports and other documents shall be stamped, signed and dated by the responsible Missouri registered architect or engineer where required under the Contract Provisions, under generally accepted architectural or engineering practices or by applicable laws.

The plan shall set forth the level, frequency and methods of review of the adequacy of the design of the Project, including the methods by which all final Design Documents and Construction Documents shall be independently reviewed and verified for adequacy of design

and back-checked in accordance with generally accepted design and engineering practice by experienced architects and engineers not involved with the preparation of such Documents.

The plan shall set forth the procedures for coordinating Work performed by different persons in the same area, or in adjacent areas or in related tasks to ensure that conflicts, omissions or misalignments do not occur between drawings or between the drawings and the specifications and to coordinate the review, approval, release, distribution and revision of documents involving such persons.

The plan shall identify those elements of the Contract Provisions, Design Documents or Construction Documents, if any, requiring special Quality Control and/or Quality Assurance attention or emphasis, including applicable standards of quality or practice to be met, level of completeness and/or extent of detailing required.

The plan shall identify by discipline, the name, qualifications, duties, responsibilities and authorities for all persons proposed to be responsible for QC/QA.

The plan shall state any requirement for, and the name, qualifications, duties, responsibilities and authorities of, external technical experts necessary to ensure the quality of the design of the Project, the anticipated timing of use of, the expected availability of, and any coordination required with respect to any such experts.

The plan shall describe the required design quality control and assurance functions, including scheduled activities for Design QC/QA identifying the Design Documents and Construction Documents to be delivered to USACE for its review at each stage of the design or work phase of the Project.

All documents shall be maintained by the Design-Builder for the duration of the Contract and shall be organized, indexed and delivered to USACE (1) upon Final Acceptance unless required to be delivered earlier pursuant to the Contract Provisions, or (2) even if incomplete, within seven days of receipt of request from USACE. These documents should include but not be limited to the following items: design criteria, reports and notes, calculations, drawings, schematics, supporting materials, etc.

4.2 Design Quality Review

Prior to the release of final Design Documents and Construction Documents, the Design-Builder shall complete review with architects and engineers experienced in the appropriate disciplines(s). The review shall verify that the Design Documents and Construction Documents were prepared in such a manner as to ensure that they will be acceptable to USACE, as well as the Design-Build Team. The criteria used in such review shall include (1) conformity of the final Design documents and Construction Documents with the Contract Provisions; (2) assurance that all materials, equipment and elements of the Work provided for in such documents which shall be incorporated into the Project have been provided for and designed to perform satisfactorily for the purpose intended; (3) the appearance, organization, technical and grammatical accuracy of such documents; (4) verification that such documents have been checked and signed by the drafter, designer, checker and reviewers; (5) where required under the Contract, generally accepted architectural or engineering practices or applicable law, verification that such documents have been stamped, signed and dated by the responsible Missouri registered civil engineer or architect; and (6) assurance that such documents fully provide for constructability, compatibility of materials and conformity to acceptance criteria for inspections and tests as provided in the Contract.

4.3 QC/QA of Design Changes

Changes, including field changes, in the design of the project or any portion thereof as shown on the Design and Construction Documents, shall be subject to design QC/QA measures and procedures commensurate with those applied to the original design of the portion of the Project being changed. Furthermore, all changes described in this Section shall be approved in writing by the organization that performed the original design, with the written approval of USACE. Any changes affecting the basic configuration of the Project shall also be subject to the requirements contained in this Section.

5.0 Documentation

The documents that the Contractor shall submit to the Government for each submittal are listed and generally described hereinafter. Unless otherwise indicated, the Contractor shall submit twenty (20) copies of each item required to be submitted at the Preliminary and Final Conformance Review Submittal stages. All drawings for review submittals shall be half-size black lines. At the Design Complete Submittal, the Contractor shall also submit five (5) complete full-size sets of drawings, five (5) complete half-size sets and two copies of CADD files in Intergraph format, five (5) sets of any project special provisions (similar in form and content to standard MoDOT specifications) and two (2) copies on floppy disks in ASCII.

5.1 Mailing of Design Submittals

Mail all design submittals to the Government during design and construction, using an overnight mailing service. The Government will furnish the Contractor addresses where each copy shall be mailed to after award of the contract. The submittals shall be mailed to four (4) different addresses.

Each design submittal shall have a transmittal letter accompanying it indicating the date, design percentage, type of submittal, list of items submitted, transmittal number and point of contact with telephone number.

6.0 Coordination

6.1 Written Records

Prepare a written record of each design site visit, meeting, or conference, either telephonic or personal, and furnish within five (5) working days copies to the Contracting Officer and all parties involved. The written record shall include subject, names of participants, outline of discussion, and recommendation or conclusions. Number each written record for the particular project under design in consecutive order.

6.2 Design Needs List

Throughout the life of his contract the Contractor shall furnish a biweekly "needs" list for design related items. This list shall itemize in an orderly fashion design data required by the Contractor to advance the design in a timely manner. Each list shall include a sequence number, description of action item, name of the individual or agency responsible for satisfying the action item and remarks. The list will be maintained on a continuous basis with satisfied action items checked off and new action items added as required. Once a request for information is initiated, that item shall remain on the list until the requested information has been furnished or otherwise resolved. Copies of the list will be sent to the USACE Administrative Contracting Officer, Corps of Engineers district office and MoDOT district office.

7.0 Government Review Comments

Within 21 days after Notice to Proceed, the Contractor shall submit, for approval, a complete design schedule with all submittals and review times indicated in calendar dates. The Contractor shall update this schedule monthly.

After receipt, the Government will be allowed fourteen (14) days to review and comment on each 50% design submittal and twenty-one (21) days to review and comment on each 95% design submittal, except as noted below. For each design review submittal, the COR will furnish the Contractor comments from various design sections and from other concerned agencies involved in the review process. The review will be for conformance with the technical requirements of the solicitation and the Successful Offeror's (Contractor's) RFP proposal. If the Contractor disagrees technically with any comment or comments and does not intend to comply with the comment, he must clearly outline, with ample justification, the reasons for noncompliance within five (5) days after receipt of these comments in order that the comment can be resolved.

The Contractor shall furnish disposition of all comments, in writing, with the next scheduled submittal. The Contractor is cautioned in that if he believes the actions required by any comment exceeds the requirements of this contract, that he should take no action and notify the COR in writing immediately. Review conferences will be held for each design submittal at Fort Leonard Wood. The Contractor shall bring the personnel that developed the design submittal to the review conference. These conferences will take place the week after the twenty-one (21) day review period.

If a design submittal is over one (1) calendar day late in accordance with the latest design schedule, the Government review period will be extended 7 days. The review conference will be held the week after the review new period. Submittals date revisions must be made in writing at least one (1) week prior to the effect submittal.

8.0 Design Analysis

8.1 Media and Format

Present the design analysis on 8-1/2-inch by 11-inch paper except that larger sheets may be used when required for graphs or other special calculation forms. All sheets shall be in reproducible form. The material may be typewritten, handlettered, handwritten, or a combination thereof, provided it is legible. Side margins shall be 1-inch minimum to permit side binding and head to head printing. Bottom margins shall be 1-1/4-inched, with page numbers centered 1-inch from the bottom.

8.2 Organization

Assign the several parts and sheets of the design analysis a sequential binding number and bind them under a cover indicating the name of the facility and project number, if applicable. The title page shall carry the designation of the submittal being made. The complete design analysis presented for final review with final drawings and specifications shall carry the designation "FINAL DESIGN ANALYSIS" on the title page.

8.3 Design Calculations

Design calculations are a part of the design analysis. When they are voluminous, bind them separately from the narrative part of the design analysis. Present the design calculations in a clean and legible form incorporating a title page and index for each volume. Furnish a table of contents, which shall be an index of the indices, when there is more than one volume. Identify the source of loading conditions, supplementary sketches, graphs, formulae, and references.

Explain all assumptions and conclusions. Calculation sheets shall carry the names or initials of the computer and checker and the dates of calculations and checking. No portion of the calculations shall be computed and checked by the same person.

8.4 Automatic Data Processing Systems (ADPS)

When ADPS are used to perform design calculations, the design analysis shall include descriptions of the computer programs used and copies of the ADPS input data and output summaries. When the computer output is large, it may be divided into volumes at logical division points. Precede each set of company printouts by an index and by a description of the computation performed. If several sets of computations are submitted, a general table of contents in addition to the individual indices shall accompany them. Preparation of the description, which must accompany each set of ADPS printouts, shall include the following:

1. Explain the design method, including assumptions, theories, and formulae.
2. Include applicable diagrams, adequately identified.
3. State exactly the computation performed by the computer.
4. Provide all necessary explanations of the computer printout format, symbols, and abbreviations.
5. Use adequate and consistent notation.
6. Provide sufficient information to permit manual checks of the results.

9.0 Drawings

9.1 Drawing Requirements

Computer-Aided Design and Drafting (CADD) shall be required for this project. The Contractor shall use Bentley MicroStation. The Contractor shall be responsible for delivering the drawings in the proper CADD format (MoDOT CADD Standards). A table of drawings sheets, file names, layers, views, etc., shall be provided indicating which files, layers, etc., are needed to reproduce each sheet of the drawings. A copy of this file shall be provided to the Government on CD-ROM. All drawings shall be legible and easily readable when reproduced at half-scale.

9.2 Drawing Format

All drawings shall be prepared in accordance with MoDOT standards as described below. Design criteria and referenced drawings furnished by the Government are intended to serve as a minimum standard in the preparation of acceptable drawings and specifications.

9.3 Drawing Files

The Contractor shall be responsible for returning to the Kansas City District electronic files created by the contractor for the Design Complete Submittal. All electronic files shall be fully compatible with the latest version of the required CADD software. The CADD data for the Design Complete Submittal shall be delivered on a compact disc (CD). All review submittals shall be half-size drawings and the Design Complete Submittal shall be full-size, reproducible drawings.

9.4 Drawing Standards

Drawings shall meet the requirements of MoDOT's CADD Standards Manual. Each drawing shall be a full size plan sheet of 22" x 34" nominal size. All images shall be within a border of 20.375" x 31.25" with 0.75" of space on the right and bottom edges. All drawings shall be self-contained or furnished with the supporting library of symbols and all resource files and details to make the drawings complete in the format provided.

9.5 Drawing Scale

The plan drawings shall be to a represented scale of 1" = 50'. The geometry shall consist of vector files, which can be selected and manipulated.

9.6 Other Deliverables

An ASCII (readable) file, in a comma delimited format, shall be provided to the Government that includes control points for the project alignments and proposed right-of-way lines. This file shall be state-plane coordinates and shall contain a point number, XY or NE coordinate and description of each. In addition to the file a hard copy drawing shall be provided to the Government showing the layout of the point numbers in relation to the overall project. These files and drawings shall be submitted with the Design Complete Submittal.

9.7 Payment

Payment to the contractor for the computer deliverable contract plans will not be made until all of the drawings for the project have met the satisfaction of the Government.

10.0 Specifications

10.1 Format

The contractor shall submit marked-up and final specifications as required. The specifications may be any one of the major, well-known master guide specification sources such as MASTERSPEC from the American Institute of Architects, SPECTEXT from Construction Specification Institute or Corps of Engineers Guide Specifications, etc. Use only one source for the project. Edit the specifications for this project and submit it in marked-up or redlined draft version at the Final Review submittal stage. If the design is based on a specific product, the specification shall consist of the important features of the product. The specification shall be detailed enough such that another product meeting the specification could be substituted and it would not adversely impact the project. After incorporation of comments, submit a final, design complete specification package. Submit one (1) original hard copy set of the specifications and a copy on CD-ROM in ASCII. Delete all marked-out or redlined text and type in all inserted text.

10.2 Submittal Register

Develop the submittal requirements during the design phase of the contract, by producing a Contractor Submittal Register during design. Attach a submittal register to each section of the specifications for the submittal requirements of that section. Prepare the Submittal Register on ENG Form 4288. The Contractor shall be responsible for listing all required design and construction submittals necessary to insure the project requirements are complied with. The Register shall identify submittal items such as shop drawings, manufacturer's literature, certificates of compliance, material samples, guarantees, test results, etc, that the Contractor shall submit for review and/or approval action during the life of the contract. The Contractor shall place all the Submittal Register pages in an appendix of the final specifications.

11.0 Surveying & Mapping

11.1 General

Primary survey horizontal control has been established for the project. The initial primary control coordinates were converted from State Plane coordinates to Project Ground coordinates. The Contractor shall provide any necessary survey in accordance with the requirements below. Any questions regarding survey requirements and procedures may be found in the Missouri Department of Transportation Project Development Manual and Manual of Instruction for Geodesy, Cartography, Hydrography and Photogrammetry, dated January 1988.

Provide a written scope of work to the survey crew(s) performing this work.

11.2 Horizontal and Vertical Control

11.2.1 Establish Control

Horizontal and vertical control of second order or better shall be established from the existing control located in the vicinity of the mapping area. Descriptions and coordinates of existing monuments are provided in Appendix D. Horizontal control may be established by GPS positioning, see paragraph 11.2.6.

11.2.2 Horizontal Control

Tie the horizontal control to the Local State Plane Grid Coordinate System (NAD 27 or NAD 83). Tie all elevations to the North American Vertical Datum (NAVD 88) with no less than second order accuracy and procedures.

11.2.3 Permanent Monuments

Establish a minimum of three (3) permanent survey monuments on or adjacent to the design site. Survey monuments must be established in areas that will not be disturbed prior to and during the construction phase of the project. Stamp designation and date established on each survey monument. No less than second order horizontal and vertical control shall be established on each survey monument. Indicate a detailed description with horizontal and vertical datum on the site plan survey and design drawings. The Survey monument established on site shall meet the minimum technical standards for the State of Missouri.

11.2.4 Survey Notes

Record Survey Notes in accordance with the MoDOT Project Development Manual and submit original fieldwork.

11.2.5 Field Books

The Contractor shall complete and submit the field adjustment computation sheets with field books. The Contractor shall also furnish a sketch of the traverse on an 8 ½" x 11" sheet of paper, showing the proper orientation of the traverse.

11.2.6 GPS Control

GPS positioning may be used to establish new horizontal control at the project site. Second Order observation procedures shall be employed as described in the MoDOT Project Development Manual.

All components of a system shall be test certified by the Federal Geodetic Control Committee and meet the approval of the Cartography, Geodesy and Photogrammetry Section prior to any work. This includes:

1. Receivers
2. Antennas
3. Data Recording units and storage medium
4. Post processing hardware and software

Complete post processing procedures according to the Survey Manual.

11.3 Survey Requirements

- A. Establish a sufficient quantity of horizontal and vertical control to provide a detailed topographic survey with contour lines for the area to be surveyed.
- B. Provide spot elevations effecting design of facilities such as ground elevations, elevations on existing utilities, and on visible surface features within the area to be surveyed.
- C. Show and identify all surface and subsurface features within the area to be surveyed on the topographic maps. Locate these features by sufficient distance ties and label on the topographic sheets to permit accurate scaling and identification. Where possible, the Contractor shall contact the local utility companies to assist in locating underground lines. All manholes shall be opened and shoe pipe sizes and invert elevations.
- D. Refer to the MoDOT Project Development Manual for further specifications of procedure, data and accuracy requirements.
- E. If required, the Contractor shall stake and provide coordinates and elevations for soil borings to be drilled or provide positions of the borings if already drilled. Horizontal accuracy shall be within 1/10 of a foot. Provide a tabulated list of the coordinates and elevations.

11.4 Mapping and Accuracy Requirements

Mapping for the entire West Gate Access Road corridor has been completed. Any additional mapping required by the contractor shall meet the minimum standards for control surveys as described in the MoDOT Project Development Manual.

11.5 Site Plan Drawing(s)

Show all permanent survey monuments established on-site on the final drawing(s). Inserts on the drawing(s) and/or digital files shall show a detailed sketch of the location with description of the permanent monuments established on site. Course chart on the drawing(s) shall show coordinate and vertical values of each permanent monument. The following is an example of a course chart:

DESIGNATION OF POINT	NAME OF PROJECT AND LOCATION			
	TYPE MARK DATE	NORTHING NAD 27	EASTING NAD 27	ELEVATION NGVD 29
21A-3B	CONC. MON, 1994	345,123.34(ME)	1,234,456.00(ME)	234.56 FT.
21A-3C	REBAR	345,140.66	1,234,400.56	246.98 FT.
BB-3	REBAR	345,340.45	1,234,645.14	76.33 M
21A-3D	CONC. MON, 1994	345,450.98	1,234,823.34	77.45 M

11.6 Digital Data

- A. The 3-D MicroStation .dgn file comprised of photogrammetric data was transformed from State Plane coordinates to project ground datum.
- B. Field survey data of utility locates and drainage features were obtained with an electronic 3-second total station using single angles and single distances with an error ellipse of 0.02 mat 95% confidence level. The field survey work was merged into the 3-D MicroStation .dgn file. Surveys with x, y, z data for areas that were obscured due to dense trees, brush or dark shadows have also been completed.

- C. Digitize the topographic and surface feature data into Intergraph IGDS 3D design file(s) and into a .TTN file according to the specifications as described in the MoDOT CADD Standards Manual.
- D. Following the completion of construction and prior to final acceptance of the project, the Contractor shall provide a complete set of digitized as-built design and construction drawings in Intergraph format (.dgn).
- E. The Contractor shall provide the Government with a copy of the design and .TTN files on a CD-ROM. The CD-ROM shall contain the cell library used to create the drawing(s) and a label shall be attached to the CD showing the project name, location, date, contractor's name, name of files, table of contents, resource files, format and backup procedure.
- F. The Contractor shall keep a copy of the digital data for a period of one year from the date of final Government acceptance. The digital data shall be made available to the Government upon request, at no additional cost.

11.7 Quality Control

Each filed book, computation sheet, topographic sheet, bridge detail and any other work submitted to the Cartography, Geodesy and Photogrammetry Section (CESAM-EN-MS) shall be reviewed and certified as correct by the Registered Land Surveyor of the State in which the project is located as follows: "I certify the data has been reviewed and meets the minimum standards for control surveys, National Map Standards and requirements of Delivery Order _____ under Contract _____" (signature and registration number).

11.8 Submittals

Deliver the following items upon the completion of surveying and mapping to:

- Field books and adjusted computation sheets.
- Sketch of traverse (8 ½" X 11").
- Station descriptions.
- Intergraph digital data of the survey.
- Intergraph digital data of the as-built drawings.
- Letter from RLS stating that mapping meets the National Mapping Standards.

If applicable:

- Tabulated listing of core drill hole positions.
- GPS log sheets.
- Satellite range observations diskettes.
- Baseline processing sheets.

12.0 Contents of Design Submittals

12.1 50% Design Submittal

The 50" design submittals shall contain as a minimum, the following:

12.1.1 Grading, Drainage and Paving

1. Explanation of objectives and factors influencing design decisions. General overview of major site features planned, such as roadway geometrics, pavement type, bridge

- selection, traffic control, etc. Rationale for locating major site elements and identification of borrow and spoil areas. Verifications that the design meets the requirements of the Scope of Work.
2. Requirements for flood protection. Selected storm drainage plan with respect to existing drainage patterns and storm drainage systems. Alternate schemes considered in arriving at selected plan. Disposition of storm water collected in the new system. Planned connections to the existing storm drainage system. Features and locations of special drainage structures. Types of materials to be specified for each installation. Verification that the design meets the requirements of Section 6.11 of the Scope of Work.
 3. Overall review of geotechnical investigations and analysis for slope stability.
 4. Pavement design analysis shall include design method and all pertinent data including traffic types, volumes, soils data and any other data used to design the pavement structures. Verification that design meets the requirements of Section 6.4 of the Scope of Work.
 5. Traffic and volume type. Particular AASHTO design vehicles for which turning movements are to be provided for and corresponding minimum turning radius.
 6. Requirements for curbs, sidewalks, guardrails, highway signing, pavement markings, fencing, etc. Intersections or connections to existing roads and streets. Traffic routing and control during construction.
 7. Site plan (geometry) and grading and drainage plan. Design plans as per Section 6.7.2 of the Scope of Work.
 8. An overall site plan on one drawing showing all paving, grading and drainage.
 9. Permit applications.

12.1.2 Geotechnical

A geotechnical report and design analysis as per the requirements of Section 6.3 of the Scope of Work,

12.1.3 Bridge and Structures Design

Design narrative and design calculations for the proposed bridge and retaining wall. Explanation of factors influencing decisions on bridge/wall type, size and location. Verification that design meets the requirements of Section 6.8 of the Scope of Work,

12.1.4 Exterior Electrical Distribution System

1. In a narrative, clearly describe the electrical distribution system and state the changes to be made to the existing system to accommodate this project. State any deficiencies to be corrected and provide a description of all new work being performed.
2. State the electrical characteristics of the power supply from the service point to the main service equipment.
3. Indicate the type, number, voltage rating and connections, and kVa rating of all transformers provided.
4. State the type of conductor to be used and provide a justification for its use.
5. Include a statement describing the criteria used for the exterior design such as primary and secondary voltage drop. Describe the physical characteristics of both the underground and overhead power lines. Provide the short circuit current available at the site and state the source of this value.
6. Include a description of all exterior lighting systems included in the design. Identify the fixture types, poles and design lighting levels. Provide point-to-point calculations showing that all design levels have been achieved.

7. Describe energy conservation measures and/or techniques that are being incorporated into the design.
8. All of the exterior electrical design drawings shall be complete with all poles (power and lighting), conductors (overhead and underground), manholes and all pertinent components detailed. Details shall include but not limited to poles, manholes, ductbanks, etc. Calculations shall support all manhole locations.
9. All removals shall be shown on demolition plans.
10. Confirm concurrence with requirements of Section 6.14 of the Scope of Work.

12.2 95% Design Submittal

The 95% design submittals shall contain, as a minimum, the following items for all submittals:

1. A complete set of construction documents, plans and specifications at the same level of detail as if the project were to be bid, including a complete list of equipment and materials to be used. The final drawings are an extension of the reviewed 50% drawings and are to include the 50% comments. The additional 5% is to complete the drawings due to the final design review comments. All details shall be shown on the drawings.
2. The design analysis is an extension of the reviewed 50% design analysis and supports and verifies that the design complies with the requirements of the project.
3. Submit marked-up specifications. The specifications shall be coordinated with the drawings and describe in detail all items shown on the drawings.

12.2.1 Exterior Electrical Distribution System

1. A coordination study with appropriate curves shall be provided to show ALL protective devices have been fully coordinated. Completed short circuit calculations for the entire electrical system shall also be provided. All equipment shall be identified by manufacturer's name and catalog number.
2. Complete voltage drop and lighting calculations shall also be provided. The voltage drop calculations shall use the same single line diagram as the short circuit calculations and shall show drops at the same locations as short circuit currents are shown.
3. The design narrative shall be an updated version of the 50% submittal but shall reflect the design as submitted. The aforementioned calculations shall be included with the narrative. The calculations and coordination study shall have the seal of the registered engineer who performed the same affixed to the cover sheet.
4. The drawings are a completed version of the 50% design drawings with all comments and any other changes incorporated.
5. All details shall be completed at this stage. Congested areas, which cannot be clearly shown at the drawing scale, shall be shown by expanded scale drawings.
6. The drawings shall be thoroughly checked for discipline conflicts to insure that the proper electrical connections are provided for equipment of other disciplines and that there are no conflicts between the location of electrical equipment and equipment of other disciplines.

SECTION 01015 – SCOPE OF WORK

1.0 General

This Scope of Work contains certain requirements relating to design and construction of the project, including requirements for providing professional services, contract administration, and Quality Control/Quality Assurance (QC/QA) for the project, and shall be interpreted as provided in the General Requirements to the Standard Specifications. This scope of Work is intended to provide clear requirements of finished Work while allowing the Design-Builder flexibility in selecting the design, means, materials, components, and construction methods used.

The project will use Federal funding and requires full conformance to all Federal Acquisition Regulations as well as established Corps of Engineers methods and policies.

2.0 Project Features

Complex geographical features along the proposed alignment of the project site that require consideration include:

- A. An existing landfill located approximately halfway between the Fort and Route H, which is estimated to be 4-7 acres in size. It was operated from the late 1940's to 1961. It is listed as containing household garbage but does not contain any biohazard waste.
- B. Bat habitats in trees along the proposed alignment. These roost trees must be cleared between November 15, 2002 and March 30, 2003. See Section 01012, Item 3.4 thru 3.4.3.
- C. Stream crossing at Roubidoux Creek, which must provide for the required design storm frequency and also for tank trail crossings beneath the bridge.
- D. Roubidoux Creek is considered a MDC Agency Management Area for trout management waters. In-stream activities and any activities that potentially create runoff to the creek must be avoided from November 15 to February 15 of any year.
- E. The East End of the proposed alignment bisects a former housing development, which contains existing building foundations and abandoned utilities.
- F. Eight (8) archaeological sites, which require Phase II study, were identified on the proposed Westgate Access Road alignment and clearance of these sites will be completed by Fall 2002. Refer to Section 6.5.6 for the location and description of these sites.
- G. An existing entrance to an operational rock quarry is located at approximately Station 121+00 and will need to be relocated as shown on the plans. Uninterrupted ingress and egress to the quarry must be maintained at all times.

3.0 Project Requirements

The project must be designed and constructed in conformance with MoDOT requirements. The Design-Builder shall be responsible for including all Work items necessary to fully address these requirements.

This project will require design and construction work items for grading, paving, hydrology/hydraulics, structures, signing, delineation, illumination and signalization. The project will also require QC/QA for design, QC for construction, design and construction surveying and contract administration. QA for construction will be performed by USACE.

The existing approach pavements of Indiana and Pulaski Avenues will be improved to include turn lanes at the intersection of the West Gate Access Road. This intersection will also be signalized. The mainline and shoulder pavement will be designed to meet MoDOT minimum pavement structure requirements. Permanent lighting will be required from the Indiana/Pulaski intersection to the end of the Contractor's design layout station that is equivalent to the RFP

design layout Station 305+58.

The grading work for the future West Gate entrance area shown at approximately Station 99+00 is to be completed as part of this project. The parking area, additional lane paving and gate building are not included in this project.

All required borrow and/or waste sites shall be adjacent to the footprint of the proposed future 4-lane roadway. Borrow may be obtained from future cut locations. Waste is to be used to construct any required future embankments. All construction procedures for borrow and waste shall be according to the MoDOT Standard Specifications.

Disposal of vegetative material is the responsibility of the Contractor, regardless of method Contractor chooses. In the event the design build Contractor chooses burning of material as a disposal method, it is the design build Contractor's responsibility to apply for the applicable permit from the Missouri Department of Natural Resources (MDNR). The design build Contractor is advised to contact the MDNR for clarification on burning of material or obtaining permits for burning on Fort Leonard Wood, Missouri, property.

- In the event a burn permit cannot be obtained, or if the Contractor chooses to dispose of vegetative material otherwise, up to 20% of the material may be disposed of on site at locations approved by the Government adjacent to clearing limits. Windrowing inside clearing limits is unacceptable. Disposal piles shall be no higher than 4 feet.
- The balance of material (80%) may be disposed of by chipping, commercial timber harvest or firewood. Chips may be placed at locations approved by the Government adjacent to clearing limits.

The Contractor is not required to use any of the above methods of disposal, and may choose other methods.

The Contractor is responsible and liable for all activities under the contract related to timber harvesting and woodcutting.

4.0 Drawings

The drawings as listed on the cover sheet of the preliminary plans are hereby referenced and fully incorporated into the work included in this Request for Proposal.

5.0 Design References

Design references developed and published by MoDOT and other agencies that are required for use in the design of this project are listed in this Section. This list is intended only to assist the Design-Builder in identifying the relevant references. These design references are considered to be the minimum applicable standards.

The design of the project work shall be in accordance with this Scope of Work and the references listed herein. It is the responsibility of the Design-Builder to obtain clarification on ambiguities and conflicts, if any, prior to proceeding with design and construction.

Standard Plans are listed as a source of information for a preferred and acceptable means of performing redundant type work. The Design-Builder may use the Standard Plans as appropriate for the specific design for the project. If Standard Plans are specified in this Scope

of Work as a project requirement, the Design-Builder shall use the Standard Plans as provided with no modification.

5.1 Project Specific Reports, Studies and Informational Documents

The following documents are applicable to this project and are either attached or available as noted:

- Engineering Considerations and Instructions – Appendix A
- Drainage Design Analysis – Appendix B
- Floodplain Map – Appendix C
- Monumentation List – Appendix D
- QC/QA Reference Tables – Appendix E
- Bridge Memorandum and TS&L Drawings – Appendix F
- Baseline Geotechnical Report (for information only) - Appendix G
- Environmental Assessment – Available for review at the Waynesville City Hall, 201 North Street, Waynesville, MO, 65583

The Engineering Considerations and Instructions (ECI) document outlines the engineering considerations that were used to formulate the preliminary design of the project and is provided as an educational tool for the Design-Builder. It provides a basis for the preliminary design and also notes areas of construction that may require special or increased surveillance and inspection. The Design-Builder is responsible for further development of the ECI as may be appropriate.

5.2 MoDOT Design Manuals and Guidelines

(Available online at <http://www.modot.state.mo.us/design/ppdm/ppdm.htm>)

- MoDOT Project Development Manual
- Missouri Standard Plans for Highway Construction, October 2001
- Missouri Standard Specifications for Highway Construction, 1999 and all current Special Provisions
- MoDOT Bridge Design Manual, 2001
- MoDOT Drainage Design Procedure, Section 9
- MoDOT General Construction Manual
- MoDOT Local Public Agency Manual
- MoDOT Material Manual
- MoDOT Traffic Engineering Marking Policy and Standards, May 2000
- MoDOT Traffic Engineering Signing Policy and Standards, use latest revision

5.2.1 Special Provisions Related to USACE/MoDOT Specifications

In the case of a conflict between the USACE specifications and provisions contained within this Request for Proposal, and the Division 100, General Provisions of the MoDOT Standard Specifications, the USACE specifications and provisions shall govern.

This is a lump sum bid solicitation and any references to measurement and payment in the MoDOT Standard Specifications are deleted for the purposes of this Request for Proposal. No measurement for payment will be made of individual work items and all payments will be on a lump sum basis according to the requirements of this Request for Proposal. Calculations and payment for the Pavement Bonus will be per the requirements of Section 00010.

5.3 General References and Publications

The Construction Documents shall define the project requirements using MoDOT references and publications, with any necessary supplementation provided by appropriate AASHTO and/or FHWA references. The following general regulations, references, and publications supplement the preceding references and those specifically referenced in the Scope of Work and shall be selected by the Design-Builder, as appropriate, to control the work described in the Contract Provisions. Inquiries concerning inconsistencies and conflicts shall be directed to the USACE Resident Engineer. All editions shall be current editions.

5.3.1 Environmental

- National Environmental Policy Act of 1969
- 36 CFR 800 - Protection of Historical and Cultural Properties
- 23 CFR 771 - Environmental Impact and Related Procedures
- 23 CFR 772 - Procedures for the Abatement of Highway Traffic Noise and Construction Noise
- FHPM 7-7-9 - Air Quality Guidelines
- Endangered Species Act of 1973, and supplements
- Executive Order 11990 (Protection of Wetlands)
- Executive Order 11988 (Floodplain Management)
- National Historic Preservation Act of 1966
- Section 4(f) of the Department of Transportation Act
- Section 404 of the Clean Water Act of 1977 (33CFR320-330)
- FHWA Technical Advisory T6640.8, "Guidance Material for the Preparation of Environmental Documents"
- Section 1424(e) of the Safe Drinking Water Act (Sole Source Aquifer Review)
- 36 CFR 60 - Determinations of Eligibility for Inclusion in the National Register of Historic Places
- Public Law 91-646 - Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970
- Resource Conservation and Recovery Act (RCRA)
- Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA)
- Superfund Amendments and Reauthorization Act (SARA)
- Section 402 Clean Water (NPDES)
- Hazardous Waste Management Act (HWMA)
- Underground Storage Tank Act of 1986
- Local codes and ordinances relating to air quality, noise, dust abatement, light, drainage, etc.

5.3.2 Drainage-Hydraulics-Hydrology

- MoDOT Bridge Design Manual, Hydraulic Design, Section 8.2
- MoDOT Design Manual, Section 9, Hydraulics and Drainage
- "Design of Bridge Deck Drainage", Publication No. FHWA-SA-92-010
- FHWA Hydraulic Engineering Circular No. 18, "Evaluating Scour at Bridges"
- "Drainage of Highway Pavements", FHWA Hydraulic Engineering Circular No. 12, March 1986
- "Hydraulic Design of Highway Culverts", FHWA Hydraulic Design Series No. 5, September 1985

5.3.3 Roadway Geometrics

- AASHTO - A Policy on Geometric Design of Highway and Streets, 2001
- AASHTO - Roadside Design Guide, 1996
- Manual Uniform Traffic Control Devices, 2000

5.3.4 Materials

- Annual Book of American Society for Testing and Materials Standards
- AASHTO Guide for Design of Pavement Structures
- AASHTO Materials Specifications and Tests

5.3.5 Geotechnical

- Foundation Investigations for Structural Procedures by MoDOT including all referenced policy manuals
- AASHTO Manual on Subsurface Investigations (1988)
- AASHTO Standard Specifications for Highway Bridges, 16th Edition, 1996, and Interim Revisions through 2000
- Checklist and Guidelines for Review of Geotechnical Reports and Preliminary Plans and Specifications, FHWA-ED-88-053, 1988
- Drilled Shafts: Construction Procedures and Design Methods, IF-99-025, FHWA, 1999
- Design and Construction of Driven Pile Foundations, Vol. 1 & 2, HI-97-013 & HI-97-014, FHWA, 1997
- Geosynthetic Design and Construction Guidelines, FHWA HI-95-038, 1995
- Slope Stability Reference Guide for National Forests in the United States, Vol. 1, 2, and 3, US Forest Service, 1995
- Rock Slopes: HI-99-007, FHWA, 1998
- Rock Blasting and Overbreak Control, HI-92-01, FHWA, 1992
- Load and Resistance Factor Design (LRFD) for Highway Bridge Substructures, HI-98-032, FHWA, 1998
- AASHTO LRFD Bridge Design Specification, Second Edition, 1998 and Interims through 1999.

5.3.6 Water Quality

- National Pollutant Discharge Elimination System (NPDES) Storm Water General Permit for Construction Activity for the State of Missouri.
- Evaluation and Management of Highway Runoff Water Quality, FHWA, June 1996.
- AASHTO Highway Drainage Guidelines, Volume III (Federal Funds)

5.3.7 Traffic Design (Highway Lighting, Signing and Traffic Control)

- AASHTO Informational Guide to Roadway Lighting
- AASHTO Roadside Design Guide, 1996
- National Electrical Code
- Manual of Uniform Traffic Control Devices, 2000
- Standard Highway Signs, Federal Highway Administration, 1979

5.3.8 Bridges/Structures

- AASHTO Standard Specifications for Highway Bridges, Sixteenth Edition, 1996 and current Interim Revisions.
- AASHTO Guide Specification for Fatigue Design of Steel Bridges
- AASHTO Guide Specification for Structural Supports for Highway Signs, Luminaries,

and Traffic Signals, 2001

- PCA "Design of Continuous Highway Bridges with Precast, Prestressed Concrete Girders", August 1969
- ANSI/AASHTO/AWS Bridge Welding Code D 1.5-96
- Any other AASHTO specifications that may be required

5.3.9 Roadside Restoration

- Roadside Design Guide, AASHTO, 1996

6.0 Professional Services

This Section sets forth requirements to be met by the Design-Builder in designing the project and preparing Design and Construction Documents. The Design-Builder shall perform all work in accordance with the policies and procedures in effect at the time the Request for Proposal is issued, unless otherwise directed.

6.1 Design Features

The Design-Builder shall provide the engineering services required to furnish the work products identified in this Request for Proposal. The services include the tasks of data preparation, data interpretation, Design Document and Construction Document preparation. Design and Construction Documents shall be prepared by (or under the direction of) a Professional Engineer, licensed in the State of Missouri and shall carry the Professional Engineer's signature and seal.

Design of this project shall be based on the specific design criteria listed below. The design criteria listed in this Section are specific requirements that take precedence over other references. When specific requirements are not listed, design references listed in Section 5.0 shall be used to formulate the basis for the design of the project work.

6.2 Surveys and Mapping

6.2.1 Design Surveying

The Design-Builder shall review data provided by USACE. The Design-Builder shall be responsible for any and all additional field survey work that may be required. All field survey work shall be suitable for Design and Construction Document preparation and meet the technical requirements of MoDOT and the Missouri Board for Architects, Engineers and Professional Land Surveyors. Any enhancement of the primary controls shall meet Second Order Class II accuracy.

The Design-Builder shall obtain any permits that may be required prior to beginning fieldwork. A traffic control plan should be prepared, if required.

The Design-Builder shall delineate the proposed right-of-way so that utility companies may prepare relocation plans. Delineation with strips of plastic flagging attached to lath located at appropriate intervals shall provide a clear delineation of the right-of-way.

The Design-Builder shall modify the monumentation and install monument posts according to Section 3-04 of the MoDOT Project Development Manual. DPW-FLW will supply and install the monument plaques at a later date.

6.2.2 Construction Surveying

To facilitate the establishment of lines and elevations, USACE will provide the Design-Builder with the following primary survey and control information:

- A. Descriptions of a minimum of two primary control points used for the horizontal and vertical control. Primary control points will be described by reference to the coordinate system and elevation datum utilized by the project. In addition, USACE will supply horizontal coordinates for the beginning and ending points and for each Point of Intersection (PI) on the right-of-way alignment included in the project.

Copies of the USACE provided primary survey control data are available in Appendix D. Any enhancement of the primary controls by the Design-Builder shall meet Second Order Class II accuracy.

The Design-Builder shall be responsible for all additional surveying necessary to complete the work. Except for the survey control data to be furnished by USACE, all calculations, surveying, and measuring required for setting and maintaining the necessary lines and grades shall be the Design-Builder's responsibility. The Design-Builder shall report all field survey work in project ground datum.

The Design-Builder shall maintain detailed survey records, including a description of the work performed on each shift, the methods utilized, and the control points used. The record shall be adequate to allow the survey to be reproduced. The Design-Builder shall supply their survey records to USACE as stated in Section 01012.

The Design-Builder shall ensure surveying accuracy.

USACE may spot-check the Design-Builder's surveying. These spot-checks will not change the requirements for normal checking by the Design-Builder.

6.3 Geotechnical Design

The Baseline Geotechnical Report (Appendix F) is provided for information only and the Design-Builder is required to perform all investigations and analysis in order to prepare a geotechnical report and recommendation for the project.

6.3.1 Design Criteria

Foundations

The minimum factors of safety for bearing capacity, uplift and lateral capacity design of foundations shall be in accordance with the MoDOT Bridge Design Manual and Foundation Investigation Procedures, where identified. AASHTO Standard Specifications for Highway Bridges shall be used where MoDOT Manuals do not address factors of safety.

Auger cast piles shall not be used for support of walls and bridge structures.

If liquefiable soils are determined to be present, and it has been determined that they will in fact liquefy under the design earthquake for the site, the soil shall be stabilized to protect the bridge from damage due to lateral deformation and downdrag caused by the liquefaction or the structure shall be designed to withstand the forces and moments resulting from the lateral and vertical movements caused by the liquefaction. Additionally, the design of the foundations shall be evaluated with the soil in a liquefied state.

Cuts, Fills, Excavation, and Other Geotechnical Features

The minimum factor of safety for the stability design of slopes shall be 1.25. A higher factor of safety, per the AASHTO Standard Specifications for Highway Bridges, 1996 with current interims, shall be used where the slope supports a wall or other structure.

6.3.2 Qualifications

The individual with overall responsibility for development of the geotechnical design shall be a Professional Engineer licensed by the State of Missouri having a minimum of seven years supervisory experience in geotechnical design as applied to roadway or bridge design.

The individual responsible for installation and monitoring of any instrumentation used to verify the performance or integrity of the geotechnical features, including CSL Testing, inclinometer measurements, piezometers, settlement indicating devices, SPT testing, electronic cone testing, etc., shall have a minimum of 2 years of experience with the specific type of instrumentation the individual will be using.

6.3.3 Geotechnical Investigation

The Design-Builder shall conduct additional explorations as determined necessary by the Design-Builder at bridge foundation locations, along the alignment of planned retaining walls, at locations of significant cuts and fills, at minor structures such as culverts, signs, signals, and luminaries, and at the locations of stormwater retention-detention structures to supplement the geotechnical baseline data available. The Design-Builder shall plan and conduct a subsurface investigation program as determined necessary by the Design-Builder utilizing exploratory borings, test pits, geophysical methods, and in-situ tests to provide information relative to soil, groundwater, and other geologic conditions along the project alignment for final design. The investigation shall be in accordance with MoDOT Project Development Manual and Foundation Investigations for Structures procedures. All boring locations shall be surveyed, and station, offset, elevation, and state plane coordinates shall be determined and included on the boring logs.

Geotechnical requirements contained in the referenced MoDOT and AASHTO Manuals and the Checklist and Guidelines for Review of Geotechnical Reports and Preliminary Plans and Specifications, ED-88-053, FHWA, 1988 shall be considered as minimum requirements. These are not intended to preclude innovative methods of Geotechnical investigations and testing that may be proposed by the Design-Builder. Soil properties used for design shall be determined in accordance with MoDOT procedures and the AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing. Field tests shall be conducted in general accordance with appropriate American Society for Testing Materials (ASTM) and MoDOT standards. Laboratories selected by the Design-Builder to perform geotechnical testing and analyses must be MoDOT-approved. All test results shall be included in the Geotechnical Report.

The Design-Builder shall secure an access permit from Fort Leonard Wood and/or MoDOT, which may require the preparation of an equipment access plan, description of equipment types, a plan of the test hole locations, etc. The Design-Builder shall adhere to all traffic control requirements when taking samples on existing roadways and other requirements for access and site conduct.

The Geotechnical Report shall summarize the results of the field exploration and all of the equipment used. Down hole hammers or wire line operated hammers shall not be used for Standard Penetration Tests (SPT). Boring logs with station, offset, elevation, state plane coordinates, groundwater elevations, uncorrected SPT test results with blows per 6 inches shall be provided. For cone penetrometers, a plot showing tip resistance, friction, friction ratio, pore water pressure, and inclination with depth shall be provided. Soil units encountered in the field exploration shall be described and their extent and limits shall be identified. Soils profiles shall

be developed and shown for all structures and significant cut and fill slopes. Plan views shall be prepared that show the actual locations of the borings in relation to project elements.

The Design-Builder shall provide and install field instrumentation in the exploratory borings of the project conducted by the Design-Builder to monitor water levels and slope movements during both design and construction as needed to satisfy the design and quality control requirements. Instrumentation for quality control on construction may include, but not be limited to, the monitoring of slope movement, wall movement, pore pressure, settlement, and settlement rates. The Design-Builder shall identify the recommended instrument types, locations, installation requirements, zones of influence, and critical readings or levels in the geotechnical report. All instruments shall be installed and monitored by the Design-Builder. Instrumentation readings shall be included in the geotechnical report, and included in supplemental instrumentation monitoring reports as needed for additional readings, including monitoring done during and after construction as part of the QA/QC plan.

6.3.4 Geotechnical Studies

The Design-Builder shall perform necessary geotechnical engineering analysis to identify critical design elements and provide a basis for geotechnical recommendations. Descriptions of the analysis and/or calculations shall be provided at USACE's request. The Design-Builder shall provide comprehensive geotechnical engineering design recommendations for the project. The recommendations shall be detailed and complete for the design of structures, cut slopes, fill slopes, embankments, and drainage facilities. At a minimum the Design-Builder shall address the following:

- A. Overall stability for cut slopes, embankments, and structures shall be assessed. For structures, minimum foundation widths, embedment, overexcavation, and ground improvement shall be addressed to satisfy overall stability requirements. Maximum cut and fill slope inclinations shall be determined. Any mitigating measures needed to obtain the required level of safety for slopes shall be fully developed for the project.
- B. For structures, suitable foundation types shall be assessed and alternate foundation types recommended. For spread footings, allowable bearing capacity and settlement shall be provided. For seismic design of spread footings, ultimate bearing capacity and shear modulus values shall be determined for strain levels likely to occur in the design seismic event. For piles and drilled shafts, ultimate capacity figures shall be developed that show the capacity in relation to tip elevation for both compression and tension. Settlement shall be assessed and group reduction factors shall be determined. Downdrag and lateral squeeze shall be reviewed as appropriate. Parameters for P-y curve development shall be developed. Minimum tip elevations, casing requirements, and estimates of driveability shall be provided.
- C. Suitable retaining wall types shall be recommended per MoDOT approved types. For all walls (including standard, pre-approved proprietary, and non-preapproved proprietary walls), bearing capacity, settlement, construction considerations, and internal and external stability shall be addressed.
- D. Earthwork recommendations shall be provided including subgrade preparation, material requirements, compaction criteria, pavement thickness design and settlement estimates. In areas where compressible soils are encountered, overexcavation, staged construction, instrumentation, settlement, and creep characteristics and estimates shall be addressed as well as details of any mitigating measures needed to keep embankment performance within project constraints.

- E. Seismic hazards shall be assessed and recommendations shall be provided to mitigate the effects of the identified seismic hazards.
- F. Engineering analysis shall be performed to determine if geologic formations, sinkholes, caves, springs or faults are present in the proposed alignment. If these geologic features are present, then appropriate design and construction elements must be incorporated to reduce the potential that these features might have on the roadway construction and use.
- G. At stream crossings, evaluation of alternatives and recommendations shall be provided for installing new culverts or constructing a bridge structure. Pipe bedding, subgrade preparation, bearing capacity, and settlement shall be addressed.
- H. General drainage, groundwater, pH, and resistivity values as they apply to the project shall be provided. Drainage studies shall involve reviewing soil conditions and field data at the locations of major drainage structures. Potential impacts of drainage facilities on slope stability shall be evaluated. Recommendations shall be provided for erosion protection at outlets and for materials to be used in pond or ditch linings.
- I. For signals, illumination, and sign structures, allowable lateral bearing capacity shall be evaluated. Where poor soils are present that preclude the use of a MoDOT standard foundation design as provided in the MoDOT Standard Plans and the MoDOT Project Development Manual, design recommendations for special foundation designs shall be prepared. Foundation designs for these types of structures shall address bearing capacity, lateral capacity, rotational capacity, settlement, and construction of the foundations.
- J. Where possible, design recommendations shall be provided in tabular or graphical form.
- K. Construction considerations shall be addressed. Temporary slopes and shoring limits shall be the responsibility of the Design-Builder. Special provisions shall be prepared for elements that may encounter difficult ground conditions or that may require non-typical construction methods. Procedures for dealing with caves, sinkholes and other rock discontinuities, as well as overexcavation recommendations and backfill requirements shall be discussed and details prepared for the project. Rock removal methods shall be recommended and procedures detailed for the anticipated rock conditions to be encountered. Construction staging requirements, where applicable, shall be addressed. Wet weather construction and temporary construction water control shall be evaluated.

6.3.5 Geotechnical Report

The Design-Builder shall prepare a Geotechnical Report that summarizes the results of the exploration and engineering studies described above. The report shall present:

- A. A summary of field exploration methods, results, and interpretations, including boring and test pit logs, descriptions of soil conditions and water levels encountered during drilling, and soil profiles and cross-sections.
- B. A summary of laboratory testing methods and tabulated results.
- C. A summary of engineering studies, including material property assumptions, descriptions of computational methods, results of computations, and conclusions regarding design. The conclusions regarding design shall include recommendations for feasible and prudent foundations for each overcrossing foundation, for each wall

location, and for each drainage facility.

- D. A summary of recommendations for earthwork factors (shrink and swell), cut and fill slope rates/stability, geologic unit locations (rock blasting, etc.), suitability for embankment and/or aggregate, and pavement design.
- E. A summary of special foundation construction considerations and advisory specification requirements.
- F. Design methods for proposed or recommended foundations.
- G. Design alternatives based on Geotechnical findings.

The report shall be organized so that bridge designers and others can refer to pertinent sections. A separate bridge foundation report need not be prepared.

The Design-Builder shall provide five (5) copies of a draft version of the Geotechnical Report to USACE for review and comment. Upon receipt of written review comments from USACE, the Design-Builder shall finalize the draft report. The Design-Builder shall deliver ten (10) copies of the finalized report, signed and sealed by a Missouri Professional Engineer, to the USACE Resident Engineer.

Upon completion of the final Geotechnical report the Design-Builder may proceed with preparation of the pavement and/or foundation designs.

The Design-Builder shall include in the special provisions all notes related to materials found on the final construction documents and not already covered by the Standard Specifications or the Special Provisions in the Request for Proposal.

Design-Builder shall not be relieved of obligations to perform the Work in accordance with the Contract Provisions by reviews, tests, inspections or approvals performed by any persons, or by any failure of any person to take such action. The reviews, inspections, tests and approvals conducted by USACE and others do not constitute acceptance of the materials or Work reviewed, tested or inspected, and USACE may reject or accept any Work or materials, request changes and/or identify additional Work which must be done at any time, whether or not previous reviews, inspections, tests or approvals were conducted by USACE.

6.4 Pavement Design

New pavement sections on West Gate Access Road shall be designed by the Design-Builder in accordance with the criteria listed in this section. The new shoulder sections on West Gate Access Road shall be paved at the same depth as the through lanes. Reconstruction and pavement widening at the intersection of Indiana and Pulaski Avenues shall be designed by the Design-Builder in accordance with the criteria listed in this section.

The pavement sections for West Gate Access Road and connections shall be either asphaltic concrete or Portland cement concrete pavement.

6.4.1 Qualifications

The pavement designer shall be a qualified and State of Missouri licensed engineer having at least 10 years experience in pavement design.

6.4.2 Design Traffic Volumes

Design traffic volumes as provided by the Missouri Department of Transportation are as follows:

	ADT	Daily ESAL Units (Two Way)	
		<u>Flexible</u>	<u>Rigid</u>
Construction Year (2002)	15,340	710	1,030
Design Year (2022)	27,710	1,280	1,860
Peak Hour	10%		
ADT Trucks	10%		
Accumulated 20-year ESAL units (thousands)		7,200	10,400
Accumulated 35-year ESAL units (thousands)		16,100	23,400

6.4.3 Design Criteria – Asphaltic Concrete Pavement

The pavement design and construction for West Gate Access Road and connections shall, at a minimum, provide for a 35-year service life. The Design-Builder shall design a pavement section that provides for surface and subsurface drainage giving full consideration to frost effect and the elimination of trapped water. The pavement design shall be in accordance with the AASHTO Guide for the Design of Pavement Structures, 1993 and the MoDOT Project Development Manual and for the conditions listed below.

- A. Pavement sections shall be designed based on a 35-year design life of 8.05 million ESAL's.
- B. Lime-treated sub-base will not be permitted on this project.

6.4.4 Design Criteria - Portland Cement Concrete Pavement

The pavement design and construction for West Gate Access Road and connections shall, at a minimum, provide for a 35-year service life. The Design-Builder shall design a pavement section that provides for surface and subsurface drainage giving full consideration to frost effect and the elimination of trapped water. The pavement design shall be in accordance with the AASHTO Guide for the Design of Pavement Structures, 1993 and the MoDOT Project Development Manual, and for the conditions listed below.

- A. Pavement sections shall be designed based on a 35-year design life of 11.7 million ESAL's.
- B. Concrete pavements shall have maximum joint spacing of 15 feet and shall not be continuously reinforced.
- C. The Design-Builder shall design the concrete pavement joints with load transfer devices (i.e., dowels) to ensure a minimum of 80% load transfer at the joints.
- D. Lime-treated sub-base will not be permitted on this project.

6.4.5 Temporary Batch Plant (concrete or asphalt)

The Contractor has the option of placing a temporary batch plant within the boundaries of Fort Leonard Wood, Missouri. The temporary batch plant shall not be used for any other contract or purpose than for this solicitation. The contractor shall submit the location of the batch plant as part of the design after award submittals. The Contracting Officer shall approve the location of the batch plant. The Contractor is responsible for clearing, restoring and seeding the area that is disturbed by the batch plant and all related activities. The restoration of the site shall include the removal of all waste materials including aggregate stockpiles, asphalt, concrete, footings and sludge ponds. Any wells drilled by the Contractor shall be plugged according to MoDOT Specifications 203.2.3. The Government will retain funds in the event the Contractor does not

restore the batch plant area to a condition to the satisfaction of the Contracting Officer, and charge the actual costs for cleaning, restoring and seeding. The Contractor is responsible to obtain in their name the required environmental permits for this temporary batch plant as required in paragraph, "Permits".

6.5 Environmental

6.5.1 NEPA/SEPA Documentation

An Environmental Assessment has been completed for the project and is available upon request from the USACE Contracting Officer. Revision to this Environmental Report may be required if the project footprint changes to the point where the project becomes controversial. The Design Builder would be responsible for preparation of this additional environmental documentation.

6.5.2 Permits

USACE has determined that the proposed project alignment would require a Corps of Engineers Nationwide 404 Permit and associated 401 Water Quality Certifications. The permit will include provisions for a haul road across the Roubidoux River. The USACE will be responsible for obtaining this permit. It is the responsibility of the Design-Builder to determine if any design changes they propose necessitate any additional permits.

A National Pollutant Discharge Elimination System (NPDES) Stormwater Discharge Permit will also be required and obtained by the USACE prior to the start of construction on the project.

A No Rise Certification and Floodplain Development Permit will also be required and obtained by the USACE prior to the start of construction on the project.

The Design-Builder is responsible for obtaining all other construction-related environmental permits including, but not limited to, a Temporary Batch-Plant Permit. Construction activities may not begin until the appropriate environmental permits have been issued and approval to start has been provided by the USACE Resident Engineer.

6.5.3 Temporary Erosion and Sediment Control

This project will add approximately 25 acres of impervious surface and will require a Temporary Erosion Control and Sediment Plan as part of the Stormwater Site Plan to be prepared by the Design-Builder.

The "Temporary Erosion & Sediment Control" measures have been in effect since Oct. 1, 1992. The Missouri Department of Natural Resources (DNR) requires that these measures be implemented on roadway projects consisting of 5 acres or more.

6.5.3.1 Purpose

The purpose of these specifications is to set forth certain temporary water pollution control measures, which shall be required of the Design-Builder. The Design-Builder shall exercise best management practices throughout the life of the project to control water pollution. Construction of permanent drainage facilities as well as performance of other contract work, which may contribute to the control of siltation, shall be accomplished at the earliest practicable time. Pollutants such as chemicals, fuels, lubricants, bitumens, raw sewage, or other harmful material shall not be discharged from the project.

6.5.3.2 Description

This work shall consist of furnishing, installing, maintaining, and removing temporary control measures as shown in the Design-Builder's Temporary Erosion Control and Sediment Plan or as ordered by the USACE Resident Engineer. The control of water pollution through use of berms, slope drains, ditch checks, sediment basins, seeding and mulching, bales, silt fences, and other erosion control devices or methods, in accordance with these Specifications. Provisions are to be taken during construction to utilize standard well-head protection measures.

The temporary pollution control provisions contained herein shall be coordinated with the permanent erosion control features specified elsewhere in the contract to assure economical, effective and continuous erosion control. These provisions shall also apply to work within project easements.

6.5.3.3 Preconstruction Submittals

Prior to the start of construction the Design-Builder shall submit for acceptance its schedules for the implementation of temporary and permanent erosion control work, as are applicable for clearing and grubbing; grading; bridges and other structures at watercourses; and paving. No work shall be started until the erosion control sequences and methods of operations have been approved by the USACE Resident Engineer.

6.5.3.4 Construction Requirements

The USACE Resident Engineer may limit the surface area of erodible earth material exposed by clearing and grubbing and/or the surface area of erodible earth material exposed by excavation, borrow, and fill operations. The USACE Resident Engineer may direct the contractor to provide immediate permanent or temporary pollution control measures to prevent contamination of adjacent streams or other watercourses, lakes, ponds, or other areas of water impoundment. Such work may involve the construction of temporary berms, dikes, dams, sediment basins, slope drains, and use of temporary mulches, seeding or other control devices or methods as necessary to control erosion.

The Design-Builder shall be required to incorporate all permanent erosion control features into the project at the earliest practicable time. Temporary pollution control measures shall be used to correct conditions that develop during construction, which were not foreseen during the design stage; that are needed prior to installation of permanent pollution control features; or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.

Clearing and grubbing operations shall be so scheduled and performed such that grading operations and permanent erosion control features will follow immediately thereafter. The surface area of erodible earth material exposed at one time by clearing and grubbing, by excavating, by fill, or by borrow shall not exceed 750,000 square feet without written approval of the USACE Resident Engineer.

The USACE Resident Engineer will limit the area of clearing and grubbing, excavation, borrow, and embankment operations in progress commensurate with the Design-Builder's capability and progress in keeping current with the finish grading, mulching, seeding, and other such permanent pollution control measures. Should seasonal imitations make such coordination unrealistic, temporary erosion control measures shall be taken immediately.

The USACE Resident Engineer may increase or decrease the amount of surface area of erodible earth material to be exposed at one time by clearing and grubbing, excavation, borrow and fill operations as determined by his analysis of project conditions.

Unless otherwise provided or approved in writing by the USACE Resident Engineer, construction operations in rivers, streams and impoundments shall be restricted to those areas, which must be entered for the construction of temporary or permanent structures. Rivers, streams, and impoundments shall be promptly cleared of all falsework, piling, debris or other obstructions placed therein or caused by the construction operations.

Frequent fording of live streams with construction equipment will not be permitted. Temporary bridges or other structures shall be used wherever an appreciable number of stream crossings are necessary. Unless otherwise approved in writing by the USACE Resident Engineer, mechanized equipment shall not be operated in live streams except as may be required to construct channel changes and temporary or permanent structures. The requirements of the Section 404 permit for this project shall prevail.

The location of all local material pits, other than commercially operated sources, and all excess material areas shall be subject to the approval of the USACE Resident Engineer. Construction operations shall be conducted and pollution control measures implemented so that erosion will not result in water pollution.

In the event of conflict between these requirements and pollution control laws, rules, or regulations of other Federal, State, or local agencies, the more restrictive laws, rules, or regulations shall apply.

6.5.4 Spill Prevention, Control and Countermeasures Plan

This work shall consist of preparing a Spill Prevention, Control, and Countermeasures (SPCC) Plan and preparing for implementation of the plan.

6.5.4.1 SPCC Plan Requirements

The Design-Builder shall be responsible for the preparation of a SPCC plan to be used for the duration of the project. The plan shall be submitted to the USACE prior to the commencement of any construction activities. A copy of the plan with any updates shall be maintained at the work site by the Design-Builder.

The SPCC plan shall identify construction planning elements and recognize potential spill sources at the site. The Plan shall outline responsive actions in the event of a spill or release and shall identify notification and reporting procedures. The Plan shall also outline Design-Builder management elements such as personnel responsibilities, project site security, site inspections and training.

The Plan shall outline what measures the Design-Builder shall take to prevent the release or spread of the following:

1. Any hazardous material found on site and encountered during construction but not identified in contract documents.
2. Any hazardous materials that the Design-Builder stores, uses, or generates on the construction site during construction activities. These items include, but are not limited to, gasoline, oils and chemicals.

The SPCC plan shall also address, at a minimum, the following project-specific information:

1. Introduction
2. SPCC Plan Elements
3. Site Information
4. Management Approval
5. Site Description
6. Planning and Recognition
7. Spill Prevention and Containment
8. Spill Response
9. Reporting
10. Program Management
11. Attachments:
 - A. Emergency Action Plan
 - B. Site Plan
 - C. Inspection and Incident Report Forms

6.5.4.2 Implementation Requirements

In the event that hazardous material is encountered during the course of the work, regardless of whether or not the material is shown in the Plans, the implementation of the Design-Builder's SPCC Plan shall be included in the scope of the contract and shall be carried out by the Design-Builder.

The Design-Builder shall maintain, at the job site, the applicable equipment and material designated in the SPCC Plan.

6.5.5 Permanent Seeding

The contractor is to provide permanent seeding for all disturbed areas on the project. A mixture of 90% K-31 fescue and 10% perennial rye shall be applied at an application rate of four pounds per 1,000 square feet. On slopes that are 2:1 or steeper a mixture of 90% crown vetch and 10% perennial rye shall be used. All seed shall be AOSA (Association of Official Seed Analysis) certified. Seeded areas shall be mulched as necessary to prevent erosion.

6.5.6 Hazardous Material

A Hazardous Material Survey has been conducted as part of the Environmental Assessment and the results are included therein. Should any hazardous wastes be encountered during construction, the Contractor must contact the USACE Resident Engineer for proper identification and disposal of the wastes in accordance with State regulations.

6.5.7 Archaeological Resources

It is anticipated that all identifiable archaeological procedures and excavations will be completed prior to construction. The following table lists the archaeological sites that have been identified for Phase II Study and the status of each.

Site No.	Location	Phase II Action	Remarks
162	Station 123+00, 300' left	South 175' of the site cleared	Do not disturb the remainder of this site unless additional clearance is obtained. Fence remaining area.
660	Station 128+00, 400' left	Southeast 1/3 of the site cleared	Do not disturb the remainder of this site unless additional clearance is obtained. Fence remaining area.
506	Station 160+00, centerline	Northern 150' of the site cleared	Do not disturb other portion of this site unless additional clearance is obtained. Fence southern portion.
324	Station 180+00, centerline	Total site cleared	
768	Station 181+50, 300' right	Total site cleared	
791	Station 185+00, centerline	Total site cleared	
387	Station 212+50, 200' right	Total site cleared	Silo
238	Station 236+00, centerline	Southern entrance cleared	Tunnel

In lieu of the fencing listed above, the Design-Builder may present an alternate method to control encroachment.

If the Design-Builder proposes an alignment that varies from that shown in the RFP plan sheets, more studies to identify and clear additional the affected archaeological resources will be required. Any additional studies will be performed by and at the expense of the Design-Builder.

6.5.7.1 Restricted Areas

The Design-Builder is hereby advised that no activities may be conducted in the areas that are identified as archaeological sites in the Environmental Assessment but where Phase II studies are not being conducted. These sites may be potentially eligible for listing on the National Register of Historic Places (NRHP). The restricted activities in these areas include, but are not limited to, the following actions:

1. No vehicles or equipment will move through or any identified potential site.
2. No vehicles will be parked nor equipment or material stored in any identified potential site.
3. No tree/brush clearing or earth disturbing operations will be conducted in any identified potential site.

Any exceptions to this provision will be mutually agreed to by the Contractor, the USACE Resident Engineer, and the Archaeologist.

6.5.7.2 Unidentified Archaeological Resources

Should additional unidentified archaeological resources be uncovered or discovered during construction, the Contractor must immediately stop work in that area and notify the USACE Resident Engineer.

6.5.8 Conservation and Mitigation

All disturbed areas should be first seeded with grass as indicated in Section 6.5.5 of this Scope of Work. All areas that are outside of the MoDOT standard clear zone area are to be planted with short-leaf pine, bare-root seedlings, on a 6' spacing.

Outside the MoDOT standard clear zone area is defined for purpose of this RFP as follows:

- South side of roadway:
 - Fill Sections. Disturbed areas outside the 30 foot clear zone.
 - Cut Sections. Disturbed areas beyond clear zone or behind ditch, whichever distance is greater.
 - This applies to all areas where soil is suitable to support growth of seedlings.
- North side of roadway. Disturbed areas shall be seeded only.

The Design-Builder shall be responsible for incorporating any additional conservation or mitigation measures, which are mentioned in the final environmental documents into the design of the project.

6.5.9 Noise Abatement

Although noise mitigation is not required for this project, the Contractor must abide by the MoDOT standards for noise attenuation during construction.

6.6 Utilities

6.6.1 Known Utilities

Existing utilities within the project limits have been identified and information has been collected by USACE from utility companies and municipalities for type and approximate location. USACE will provide this "as-built" utility information on the electronic basemap however, USACE does not guarantee the accuracy of the information provided by the Utility. Therefore, this information shall be confirmed by the Design-Builder through site investigations and shall be placed on the project base map by the Design-Builder.

Potential utility conflicts consist of water, sewer, electric, and aerial fiber optic lines at the intersection of Pulaski and Indiana, as well as an electric transmission line and underground fiber optic line within the mainline roadway alignment. All utility design, utility relocation, extension or addition accomplished by the Design-Builder shall be included in the lump sum bid price for the project. All work shall be performed in accordance with Section 01100 of this Request for Proposal.

The water, sewer and power lines serving Pence School must remain in service at all times.

6.6.1.1 Sanitary Sewer Main

Owner: Fort Leonard Wood, Department of Public Works

Contact: Joe Nelson – Ph: 573.596.0946

The Design-Builder shall perform an engineering study to evaluate the impacts of construction on the existing sanitary sewer line(s). This study may include measurement of the pipe thickness where the pipe enters manholes and potholing to determine existing bedding. The Design-Builder shall provide a Professional Engineer's stamped report of such impacts based on the proposed design or a stamped declaration indicating that there are no adverse impacts. Additionally a Professional Engineer's stamped design for modifying the sanitary sewer line to protect it from the construction, if such protection is determined to be needed, shall be submitted to the USACE for review.

6.6.1.2 Waterline

Owner: Fort Leonard Wood, Department of Public Works
Contact: Joe Nelson – Ph: 573.596.0946

The Design-Builder shall perform an engineering study to evaluate the impacts of construction on the existing waterline(s). The Design-Builder shall provide a Professional Engineer's stamped report of such impacts based on the proposed design or a stamped declaration indicating that there are no adverse impacts. Additionally a Professional Engineer's stamped design for modifying the waterline to protect it from the construction, if such protection is determined to be needed, shall be submitted to the USACE for review.

6.6.1.3 Natural Gas Line

Owner: N/A

There are no natural gas lines in the project area.

6.6.1.4 Power Transmission Line

Owner: Sho-Me Power Electric Cooperative
Contact: Kevin Hopper – Ph: 417.468.2615

The transmission line is a 161 kilovolt (kV) for which Sho-Me Power has an easement. Any relocation or roadway placement within the easement will have to be coordinated with Sho-Me Power. Sho-Me Power will perform any required line relocation design and construction work and the costs of this work shall be paid for by the Design-Builder.

The Design-Builder shall perform an engineering study to evaluate the impacts of construction on the existing transmission line. The Design-Builder shall provide a Professional Engineer's stamped report of such impacts based on the proposed design or a stamped declaration indicating that there are no adverse impacts. The Professional Engineer must be licensed in the State of Missouri.

6.6.1.5 Power Distribution Lines

Owner: Fort Leonard Wood – Department of Public Works
Contact: Dale Wyant – Ph: 573.596.0936

There are existing 12.47 kV distribution lines, 480-volt street lighting (circuit and luminaries) and 240/120 secondary along Indiana Avenue and Pulaski Avenue.

The Design-Builder shall perform an engineering study to evaluate the impacts of construction on the existing power distribution line(s). The Design-Builder shall provide a Professional Engineer's stamped report of such impacts based on the proposed design or a stamped declaration indicating that there are no adverse impacts. Additionally a

Professional Engineer's stamped design for modifying the electrical lines to protect them from the construction, if such protection is determined to be needed, shall be submitted to the USACE for review.

6.6.1.6 Overhead Fiber Optic Cable

Owner: Sho-Me Power Electric Cooperative

Contact: Kevin Hopper – Ph: 417.468.2615

There are existing aerial fiber optic cables along Indiana Avenue and Pulaski Avenue. Any relocation will have to be coordinated with Sho-Me Power. It is anticipated that Sho-Me Power will perform any required cable line relocation design and construction work and the costs of this work shall be paid for by the Design-Builder.

The Design-Builder shall perform an engineering study to evaluate the impacts of construction on the existing fiber optic cables. The Design-Builder shall provide a Professional Engineer's stamped report of such impacts based on the proposed design or a stamped declaration indicating that there are no adverse impacts. The Professional Engineer must be licensed in the State of Missouri.

6.6.1.7 Buried Fiber Optic Cable

Owner: Sprint

Contact: Gary Shockley: Ph – 573.341.0479

The underground fiber optic line is located within an easement that crosses the alignment of the mainline roadway. Any relocation of the line within the easement will have to be coordinated with Sprint. Sprint will perform any required line relocation design and construction work and is also responsible for the costs of this work.

The Design-Builder shall perform an engineering study to evaluate the impacts of construction on the existing fiber optic line. The Design-Builder shall provide a Professional Engineer's stamped report of such impacts based on the proposed design or a stamped declaration indicating that there are no adverse impacts. The Professional Engineer must be licensed in the State of Missouri.

6.6.2 Location of Existing Utilities

The Design-Builder shall identify potential conflicts between new roadway and bridge features (i.e., drainage and sign bridge foundations, etc.), and existing utilities. The Design-Builder shall communicate and coordinate with utility companies and resolve utility construction conflicts.

A technical memorandum, including a map, shall be developed by the Design-Builder summarizing the conflicts and the relocation arrangements with the affected utilities. This technical memorandum shall be transmitted to USACE and the respective utilities.

6.6.3 Utility Conflicts and Adjustments

The Design-Builder shall determine any utility construction conflicts which require the utility to be relocated or adjusted, and shall advise USACE. The Design-Builder shall arrange and conduct utility coordination meetings to identify and resolve conflicts. The Design-Builder shall review relocation plans produced by utility companies to assure that utility conflicts are eliminated and that proposed utility installations conform to MoDOT requirements.

6.6.4 Utility Plans

The Design-Builder shall prepare reproducible plans showing the locations of all existing aerial and buried utility facilities and shall indicate the potential areas of conflict between the utility facilities and the roadway improvements. Vertical locations of underground utilities shall be shown on sections or details only when the actual elevation has been determined by physically exposing the utility and surveying its location.

The base map shall contain matching ground controls, at intervals of no more than five hundred feet, together with a description of the desired area for utility horizontal designation. Where elevations are necessary for the determination of conflicts, the Design-Builder shall furnish a list of the possible conflict locations and conflicting utilities. This list will be used by the Design-Builder for identification of potholing locations to provide accurate horizontal and vertical location of the utility.

In the event of a conflict, the Design-Builder shall furnish copies of the plans to each affected utility company and shall also furnish copies of cross sections upon request. The size of the plans, 1/2 size or full size, shall be as requested by the utility companies. In all cases, the plans shall be scaleable i.e., full size or true half-size. The Design-Builder shall send the plans to the utility companies, receive responses, and provide to USACE copies of all correspondence to and from the utility companies.

The Design-Builder shall include any planned or required utility relocations on the final plans.

6.6.5 Utility Relocations and Adjustments

Where a utility relocation may be required:

- A. The Design-Builder shall identify possible alternatives to minimize utility conflicts.
- B. The Design-Builder shall notify USACE promptly upon determination that relocation of a utility company facility is required.
- C. The Design-Builder will be responsible for any costs to relocate conflicting utilities unless otherwise noted in this Request for Proposal.
- D. Additions, extensions, and improvements of an existing utility facility are the financial responsibility of the utility owner. In the case of a request for addition, extension or improvement, the Design-Builder shall advise USACE of the utility company's request, for additions, extensions, and/or improvements and shall advise the utility company that approval of its request is subject to concurrence by USACE.

6.6.6 Utility Clearance Letter

The Design-Builder shall prepare a utility clearance letter and submit it, together with copies of correspondence from utility companies verifying the information, to USACE for review and concurrence.

If there are no conflicts, the clearance letter shall state that there are no utilities in conflict with construction (i.e. when there are no utility facilities needing adjustment or when all adjustments have been completed prior to writing the clearance letter).

If adjustments are needed, the clearance letter shall list each utility company separately, showing:

- A. The name of the company

- B. The nature of required adjustment
- C. The status of Agreements and permits between the Design-Builder and Utility Company
- D. The status of the utility adjustments whether:
 - 1. To be done by Design-Builder during construction
 - 2. To be done by utility company during construction, with estimated completion date or number of working days
 - 3. In progress, with estimated completion date

6.7 Roadway Design

The Design-Builder shall design all roadway geometrics including horizontal alignment, vertical alignment, cross section elements and superelevation in accordance with the Scope of Work.

Any significant change to the intent of the design may require a review of the environmental documents that have been approved for this project. If any such changes are proposed, the Design-Builder shall bear the responsibility for the cost and schedule adjustments made necessary by same.

6.7.1 Design Criteria

The Design-Builder shall utilize the criteria listed below in developing the roadway design of the project. If the criteria listed below are not achievable, the Design-Builder shall submit to USACE clear documentation of what cannot be achieved and a proposed alternative for review.

6.7.1.1 Roadway Cross Section

- A. Design Speed: 50 MPH
- B. Horizontal Alignment: the maximum degree of curvature is 4° 45'. Spirals are required for curves with a degree of curvature greater than 2°.
- C. Vertical Alignment: minimum K-value for sag vertical curves is 120. Minimum stopping sight distance for crest vertical curves is 525'. Maximum grade is 5% and the minimum desirable grade is 0.5%
- D. The required Level of Service (LOS) is C in design year 2022.
- E. Superelevation: normal crown is 2% and the maximum superelevation is 8%. Shoulders are superelevated the same rate as the traveled way.
- F. Number of Lanes: 2-12' lanes with 8' shoulders.
- G. Slopes: maximum side slopes are 6:1 within the clear zone with the exception of ditch backslopes, which will be a maximum of 2:1.

6.7.1.2 Storage Lengths - Intersection Requirements

The following minimum storage lengths shall be provided in the design of the project:

- A. Left turn from West Gate to Indiana – 250'
- B. Right turn from West Gate to Indiana – 280'
- C. Left turn from Pulaski to Indiana – 200'
- D. Left turn from West Gate to Route H – 200'

6.7.1.3 Access Control

The following considerations for access control shall be included in the design of the project:

- A. Radius returns must accommodate school busses around Pence Elementary School.
- B. The intersection of Indiana and Pulaski Avenues may be closed for a short term period during reconstruction. The proposed schedule for this closure must be approved by the USACE Resident Engineer prior to the start of construction activities.
- C. Access to the rock quarry at Station 121+00 shall be maintained at all times.
- D. Traffic flow on Route H shall be maintained at all times.
- E. All designs shall conform to the latest Americans with Disabilities Act Accessibility Guidelines Title I and II.

6.7.1.4 Roadside Protection

- A. General criteria for location and design of roadside barriers is to be based on the AASHTO Road Design Guide and MoDOT Design Policy.
- B. Clear Zone shall be as directed in the MoDOT Project Development Manual and the AASHTO Roadside Design Guide.
- C. Embankments shall be as directed in the MoDOT Project Development Manual and the AASHTO Roadside Design Guide.
- D. Roadside Obstacles shall be as directed in the MoDOT Project Development Manual and the AASHTO Roadside Design Guide.
- E. Blocked-out Thrie Beam barrier, as identified in the MoDOT Standard Plans for Highway Construction, shall be used at the bridge rail ends.
- F. End treatment for the barrier rail shall be as indicated in the MoDOT Standard Plans for Highway Construction and Special Provisions.
- G. Barrier placement shall be according to the MoDOT Standard Plans for Highway Construction.

6.7.2 Design and Plan Preparation

Design submittals shall be according to Section 01012 of this Request for Proposal.

6.7.2.1 Index and Vicinity Map

The Design-Builder shall prepare an index listing of plan sheet titles as they appear on the plan sheets and in accordance with the MoDOT Design Manual. The Design-Builder shall also prepare a vicinity map showing the Project limits in accordance with the MoDOT Project Development Manual, Section 4-03.2.

6.7.2.2 Roadway Sections

The Design-Builder shall prepare the roadway section plans in accordance with the MoDOT Project Development Manual, Section 4-03.3. Roadway sections shall provide the geometric information on the roadway cross section to be constructed.

6.7.2.3 Quantity Plans

The Design/Builder shall prepare quantity takeoffs, tabulations, and backup calculations and show quantity summaries and breakdowns as required by the MoDOT Project Development Manual, Section 4-03.4.

6.7.2.4 Plan and Profile Plans

The Design-Builder shall prepare the plan and profile plans in accordance with the MoDOT Project Development Manual, Section 4-03.5. The Design-Builder shall develop the alignment data and display the curve data and coordinates necessary to construct the Project. The Design-Builder shall calculate the alignments, profiles and superelevation diagrams for incorporation into the plan and profile plans. The plan and profile plans shall show existing and proposed horizontal and vertical alignments, grading and paving limits, existing and proposed right-of-way with stationing and distance ties, construction permits and easements, monumentation, and other applicable items as described in the MoDOT Project Development Manual. Contour plans shall be submitted if requested by the USACE Resident Engineer.

6.7.2.5 Cross Sections

The Design-Builder shall provide cross sections according to MoDOT Project Development Manual, Section 4-03.12, for review when requested. Each cross section shall include the ultimate roadway template superimposed on the plotted natural terrain. The template should be oriented 90 degrees to the centerline of the alignment being depicted. They should also identify right of way limits, walls, structures and other pertinent design data that might useful in evaluating the design. Cross sections shall normally be prepared at 100-foot intervals, as a minimum, with additional sections at breaks in the terrain unless otherwise directed by the USACE Resident Engineer. Cross sections shall be included in all submittals to utility companies.

6.7.2.6 Intersection Plan for Approval

The Design-Builder shall prepare and furnish to the USACE Resident Engineer, Intersection Plans for Approval in accordance with the MoDOT Project Development Manual. The Design-Builder shall make any revisions to the Plans requested by the USACE Resident Engineer.

6.8 Bridge and Structures Design

This section covers the design of bridges, drainage structures, sign structures and other structures in the project.

The Design-Builder shall perform structural analyses and design of the bridges, drainage structures and other structures included in the Project. All applicable regulations, codes and professional practices shall be followed and all plans, specifications and estimates shall be prepared in accordance with the Geotechnical Report, the Manuals and Guidelines listed in the Design Criteria and directions from the State Structural Project Manager.

The Design-Builder shall design all structural elements, except pile capacity, drilled shaft capacity and the size of spread footings, in accordance with the AASHTO Load Factor design method. Pile capacity, drilled shaft capacity and the size of spread footings is to be based on service loads. The live load utilized on this project is to be AASHTO HS20 modified live load with alternate military loading.

In addition the Design-Builder shall perform a superstructure load rating in accordance with

MoDOT procedures.

Design submittals shall be according to Section 01012 and 01300 of this Request for Proposal.

6.8.1 Design Criteria

All structures shall be designed and constructed using the current editions of the following criteria:

6.8.1.1 Governing Criteria

1. AASHTO "Standard Specifications for Highway Bridges," Sixteenth Edition, 1996 and current interim revisions,
2. Missouri Department of Transportation Bridge Design Manual, 2001,
3. Missouri Standard Plans for Highway Construction, 2001,
4. Missouri Standard Specifications for Construction, 1999,
5. ANSI/AASHTO/AWS Bridge Welding Code D 1.5-96,
6. PCA "Design of Continuous Highway Bridges with Precast, Prestressed Concrete Girders," August 1969,
7. Design of Bridge Deck Drainage," Publication No. FHWA-SA-92-010,
8. MoDOT Bridge Drainage Design Procedure, Section 8.2
9. AASHTO Guide Specification for Fatigue Design of Steel Bridges, and
10. AASHTO Guide Specification for Structural Supports for Highway Signs, Luminaries, and Traffic Signals, 2001.

6.8.1.2 Layout

1. The spans and general arrangement of the structure are shown on the bridge preliminary plans, which are located in Appendix F
2. A minimum horizontal and vertical clearance shall be provided as shown on preliminary plans.
3. The Bridge Memorandum for each alternate structure type can be found in Appendix F. The Design-Builder will be responsible for submitting the Bridge Memorandum, based on the finals selected design for approval.

6.8.2 Miscellaneous

6.8.2.1 Bridge Deck Drainage

1. Deck drains shall be designed to free-fall below the bottom flange of the girder or beams at locations providing 10' horizontal clearance to roadways. Other restrictions shall be per MoDOT criteria.
2. Downspouts, if used, shall be drained to the existing or proposed ground system storm sewers.

6.8.2.2 Utilities

No utilities are to be placed on the bridge. Conduit only.

6.8.2.3 Lighting

Conduit will be required for future roadway lighting.

6.9 Approach Slabs

An approach slab shall be provided at the end of each bridge, and shall be constructed according to MoDOT Standards.

6.10 Sign Structures

Sign structures shall be designed and constructed in accordance with AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals, dated 1994. New overhead sign structures shall be monotube.

6.11 Drainage Design

The Design-Builder shall provide a well-drained corridor and a safe environment for the individuals who use and maintain the highway. The design and construction of all drainage structures and appurtenances shall adequately address functionality, durability, ease of maintenance, maintenance access, safety, aesthetics and protection against vandalism according to the contract specifications and standards. In fulfilling the requirements for drainage, the Design-Builder shall abide by and fulfill the requirements related to drainage features or systems while at the same time meeting the requirements of other required design elements on the project.

Design submittals shall be according to Section 01012 of this Request for Proposal.

6.11.1 Hydrology

The USACE has completed a preliminary Drainage Design Analysis in order to provide a summary of the engineered drainage features on the project. The analysis is included in Appendix B. The Design-Builder shall conduct hydrologic and hydraulic analysis and/or obtain available public information to identify flood plains and probable flood plain impacts. The Design-Builder shall determine existing and developed conditions, discharges for all pertinent drainage systems, and existing flow patterns; assess possible drainage problems, identify possible solutions, and propose tentative hydraulic improvements. The Design-Builder shall provide a final scour analysis at the Roubidoux Creek Bridge.

The drainage system shall be designed in accordance with the MoDOT Project Development Manual and other design manuals as outlined in Section 5.3 of this Scope of Work.

The Design-Builder shall perform the drainage design for all drainage features on the project. All design work shall be documented in a Hydraulics Report including the size and location of drainage and stormwater treatment structures.

6.11.2 Design Criteria

6.11.2.1 General

These criteria have been developed to provide a summary of methodologies and standards to be used for the design of this project.

The drainage system includes all inlets, manholes, storm sewers, ditches, culverts, and other hydraulic and erosion control appurtenances required to:

1. Properly direct the storm runoff disrupted or generated by the roadway and its associated construction.

2. Protect the roadway slopes and ditches from damage by erosion.
3. Maintain clear traffic lanes for the design storm.

Drainage design is based on the US Customary English units as defined in these criteria.

These criteria are provided for guidance and are no substitute for experience or engineering judgement.

6.11.2.2 Design Specifications

The following publications are to be used in conjunction with these criteria, as guides in developing the plans for this project.

1. MoDOT Project Development Manual, 2000.
2. MoDOT Bridge Manual, 2001
3. Missouri Standard Specifications for Highway Construction, 1999 and Special Provisions.
4. Missouri Standard Plans for Highway Construction, October 2001
5. "Drainage of Highway Pavements", FHWA Hydraulic Engineering Circular No. 12, March 1986.
6. "Hydraulic Design of Highway Culverts", FHWA Hydraulic Design Series No. 5, Sept. 1985.
7. "Hydraulic Design of Energy Dissipators for Culverts and Channels", FHWA Hydraulic Engineering Circular No. 14, Sept. 1983.
8. "Design of Bridge Deck Drainage," Publication No. FHWA-SA-92-010.

6.11.2.3 Hydrologic Analysis

1. Methodology
The following methods will be used for computing stormwater runoff peak discharges and volumes:

Drainage area less than 200 acres - Rational Method

Drainage area equal to or greater than 200 acres - USGS Rural Regression Equations from MoDOT guidelines, HEC-1 or HEC-HMS, for F.I.S. streams with detailed studies, consideration will be given to the study discharges.

2. Rational Method - the following form of the rational method formula will be used:

$$Q = kCiA$$

where: Q = peak discharge, cfs
 k = dimensionless coefficient to account for antecedent precipitation
 C = runoff coefficient (dimensionless)
 i = rainfall intensity, in/hr
 A = watershed area, acres

- A. The following dimensionless coefficient will be used to account for antecedent precipitation; except the product of the k times C shall not exceed 1.0.

<u>Return Period (yrs)</u>	<u>k</u>
10 and less	1.0
25	1.1
50	1.2
100	1.25

- B. The runoff coefficient is a function of soil type and land use of the watershed. The following coefficients will be used:

<u>Description</u>	<u>Coefficient "C"</u>
Paved Surfaces	0.90
Highway Slopes & Ditches	0.35

For other land uses/zoning for 5-year and 10-year design, refer to the runoff coefficients listed in table 9-02.2 of MoDOT Project Development Manual. Refer to section 9-02.4 for the 25-year, 50-year, and 100-year flood peaks.

- C. The design intensity is a function of storm duration, the frequency, and the geographic location. The storm duration is defined as the time of concentration. See MoDOT Project Development Manual section 9-02.4(1)(c).

- D. Time of Concentration: $T_c = KL^{0.77} S^{-0.385}$

Where: T_c = the time of concentration (min)
 $K = 0.0078$
 L = the length of the principal watercourse from outlet to divide (ft)
 S = the slope between the minimum and maximum elevation (ft/ft)

Or: $T_c = 5$ minutes, whichever is greater

- E. The rainfall intensity, duration and frequency curves, for the project, can be found in Figure 9-02.9 of the MoDOT Project Development Manual.

3. For areas equal to or larger than 200 acres, the following methods are acceptable:

- A. USGS Rural Regression Equations for Region II from MoDOT Project Development Manual.
- B. US Army Corps of Engineers, Hydrologic Engineering Center HEC-1 or HEC-HMS

C. FEMA discharges when applicable.

6.11.2.4 Bridge Deck Drainage

1. Method used to estimate design flow - Rational Method.
2. Design Frequency – slab drains should be designed for a 25-year frequency rainfall
3. Time of Concentration - 5 minutes
4. Method used for Inlet Analysis - "Drainage of Highway Pavements" FHWA HEC-12, along with information acquired from the 1995 University of Missouri Rolla report "Scupper Interception Efficiency." Grate inlets at low points shall have a 50% clogging factor. Also see MoDOT Bridge Manual, section 3.3, Slab Drains.
5. Manning's "n"
 - A. Concrete pavement and shoulder 0.016
 - B. Asphaltic concrete pavements and shoulders 0.016
6. Intensity values for Missouri vary from 8.00 in/hr to 8.5 in/hr for the given frequency and time period. Therefore, a value of 8.5 in/hr is recommended for use. If local IDF curves are deemed more appropriate by the MoDOT hydraulic engineer in the Bridge Division, they may be applied.
7. Allowable Spread - the most restrictive of these criteria control.
 - a. The maximum allowable spread on any bridge with a 3 ft. or more shoulder width should be taken as 6 ft from the face of the barrier. If the shoulder width is less than 3 ft., the spread should be the shoulder width plus 3 feet from the face of the barrier.
 - b. Maximum depth of water at the barrier shall not exceed 0.45 feet.
8. Design efficiency as directed in the MoDOT Bridge Manual, section 3.30.

6.11.2.5 Ditches

1. Method used to estimate design flow - Rational Method.
2. Design Frequency - 10 years.
3. Design Methodology - as directed in the MoDOT Project Development Manual, section 9-03.

6.11.2.6 Culverts

1. Method used to estimate flow – See section 6.11.2.3
2. Design Frequency – 25 years
3. Design Methodology - as directed in the MoDOT Project Development Manual, section 9-06.
4. Minimum Size
 - A. Pipe culvert
 - i. Mainline – 24"
 - ii. Drive entrances and side roads – 18"

B. Box culvert 4 ft. x 4 ft.

5. Minimum top of culvert – 12 in. below bottom of subbase.
6. Outlet Protection - as directed in the MoDOT Project Development Manual, section 9-04.
7. Culverts with a total span of 20 ft. or greater will be considered bridge class structures.

6.11.2.7 Bridges and Bridge Class Structures

1. Method used to estimate flow – see section 6.11.2.3
2. Design Frequency
 - A. Roubidoux Creek - 100 years
 - B. Tunnel Hollow Creek – 50 years (check 100 year)
3. Design Methodology – as directed in the MoDOT Bridge Manual, section 8.2; Backwater analysis using the US Army Corps of Engineers computer program HEC-RAS.
4. Minimum clearance between design highwater elevation and the lowest elevation of superstructure:
 - A. 2 feet for drainage areas 20 square miles or larger.
 - B. 1 foot for drainage areas less than 20 square miles.
 - C. 0 foot for box culverts.
5. Maximum backwater:

Roubidoux Creek – 1 foot
Tunnel Hollow Creek – 1 foot at exit of Fort Boundary

Verify that local jurisdiction does not require a more stringent backwater value. Backwater is the difference between the normal water surface elevation and the water surface levels resulting from the roadway embankment and the bridge opening. The normal water surface elevation is the elevation of the water surface across the flood plain without the bridge or roadway embankment.

6. Bridge scour to be analyzed using FHWA HEC-18 "Evaluating Scour at Bridges".

6.11.3 Hydraulic Report

The Design-Builder shall be responsible for preparing the Draft and Final Hydraulics Report. The Hydraulics Report shall contain detailed calculations as well as rational for selecting all drainage system elements. The Hydraulics Report shall be stamped by a professional engineer registered in the State of Missouri, and three (3) copies shall be submitted prior to preparing the drainage plans.

6.11.4 Drainage Designs

The Design-Builder shall prepare drainage plans, profiles, details, and structure notes in accordance with the MoDOT Project Development Manual and other MoDOT provided information. The facilities shall be designed to effectively drain the Project. The Design-Builder shall prepare plans and details for stormwater detention/treatment facilities for runoff from within

the Project limits with minimal impacts to existing environmental features including wetlands and roadside vegetation. The Design-Builder shall prepare structure note sheets and backup calculations for these sheets in accordance with the MoDOT Project Development Manual.

Pipe sizes, lengths and other summary data shall be provided per the MoDOT standard pipe summary sheet. Drainage plan and profile drawings shall be developed which cover the entire project limits. Additional drawings shall be provided to document drainage details that are not defined in the MoDOT Standard Drawings. All drainage design drawings shall conform to MoDOT Project Development Manual.

Design reviews shall be in accordance with the QC/QA Plan Requirements. The final design submittal shall include the location of culverts, catch basins and manholes, with profiles or details showing all invert elevations and proposed finished grade elevations above the top of pipe.

The Design-Builder shall prepare design and construction documents for drainage features including, but not limited to:

- A. Drainage culverts and underpass structures
- B. Catch basins, manholes and connector pipes
- C. Drainage Pipe and Concrete Box Culvert Summary Sheets
- D. Drainage details
- E. Drainage culvert profiles
- F. Biofiltration Swales
- G. Retention/Detention Basins/Wet ponds

6.11.4.1 Storm Drain Systems

Runoff falling within the limits of the project, storm water draining into the project site, and additional drainage identified in the drainage documents for inclusion with the project shall be collected and conveyed to an existing storm drain system, or an on-site system.

Any connector pipes requiring lengthening shall be extended in kind by the Design-Builder. Connector pipe installations with less than two (2) feet of cover from the crown of the pipe to the bottom of the pavement shall be encased with a lean concrete backfill.

6.11.4.2 Inlets, Catch Basins and Pipes

Any inlet, or pipe that will not become part of the final drainage system can be removed or abandoned in place. Any such abandonment shall be done in accordance with MoDOT Standard Specifications with the following addition: Any void that may remain as a result of abandoning a drainage feature shall be filled with lean concrete or an equivalent material to guarantee that no settlement will occur as a result of the void. Catch basins that will not become part of the final drainage system shall be removed.

6.11.4.3 Connections to Existing Systems

The Design-Builder shall develop plans and specifications for connections with existing storm drain systems. These details shall be reviewed prior to making any connections. The existing drainage pattern shall not be impeded in any way that would impact the safety of the traveling public during the construction of the project.

6.11.4.4 Pipe

Pipe alternates shall be in accordance with the MoDOT Project Development Manual. Broken back pipe culverts, meeting the requirements of the MoDOT Standards, are acceptable.

6.12 Construction

Construction of this project shall be in accordance with the regulations and procedures of Executive Order 11988, Floodplain Management, and should be in accordance with the standards and criteria of the National Flood Insurance Program.

Roubidoux Creek is considered a MDC Agency Management Area for trout management waters. In-stream activities and any activities that potentially create runoff to the creek must be avoided from November 15 to February 15 of any year.

In case of a national emergency where the Fort Leonard Wood base is closed and the Contractor cannot work, additional days to complete the project will be provided, but no additional fee will be allowed.

The Contractor will be allowed to bring on the site the explosives it will use for only that day. Explosives will not be stored on the Fort Leonard Wood, Missouri, property overnight or on days blasting is not performed. The Contractor shall address in its blasting plan the method it will use in coordinating and notifying the Government for security access onto the post and for security when using explosives. The Government will provide the points of contact after issuance of notice to proceed.

6.13 Roadside Restoration Design

The Design-Builder shall design and construct certain roadside restoration elements for the purpose of restoring roadside impacts and traffic/pedestrian island areas in accordance with the Special Provisions in the Request for Proposal.

Approximately 13.5 acres of hardwood re-forestation and special seeding/planting will be required on the roadway slopes.

The areas that total the 13.5 acres will be designated by the Government and based on the Contractor's design layout. Hardwood plantings shall be spaced 10' x 10' apart (436 trees per acre).

Design-Builder (or their representative) shall have current registration in Missouri as a Landscape Architect for all work outlined in this section.

6.14 Traffic Engineering Design

6.14.1 Roadway Illumination

This section covers the illumination of the designated portion of West Gate Access Road and intersection with Indiana and Pulaski Avenues. Design submittals shall be in accordance with the requirements of Section 01012 of this Request for Proposal.

6.14.1.1 Design Criteria

The design shall be based on the following criteria:

- A. Illumination shall be furnished and installed per all State and local codes, and per MoDOT Project Development Manual.

- B. Illumination shall be shielded where there are adjacent business or residential concerns. The required illumination density shall be according to the MoDOT Project Development Manual.
- C. The designer shall comply with MoDOT's current illumination policy and provide a complete set of roadway illumination Construction Documents including, but not limited to:
 - 1. Complete roadway illumination including West Gate Access Road and intersection with Indiana and Pulaski Avenues.
 - 2. Sign Lighting (if applicable).
- D. Existing electrical services shall be upgraded, as needed, for new illumination. If a new or upgraded existing electrical service is needed, the Design-Builder shall coordinate with USACE and submit the necessary design information for the new or upgraded electrical service to the Resident Engineer. USACE will obtain any Service Agreements from the electric company.

6.14.1.2 Illumination Design

The Design-Builder shall prepare preliminary plans for the illumination. The plans shall be drawn to MoDOT standards. The plans shall include the following minimum information:

- A. Luminary pole locations.
- B. Load center locations.
- C. Power source.
- D. Conduit and conductor schedule.
- E. Voltage drop calculations (design analysis).
- F. Panelboard Schedule
- G. Luminarie Schedule
- H. Photometric Data
- I. Pole Base Foundations

All existing above and below ground utilities are also to be included in the preliminary illumination plan.

In addition, lighting calculations shall be submitted in hard copy and on computer disc.

USACE shall review the preliminary design before the Design-Builder may commence final design.

6.14.1.3 Construction

The Design-Builder shall submit as-built plans, product manuals and shop drawings for the illumination system, as required by this Request for Proposal, after construction is complete. Final acceptance will not be granted until this material is submitted.

6.14.2 Signing and Delineation

The Design-Builder shall prepare signing plans, signing specifications, and signing details for this project. The signing plans, specifications, and details shall be prepared using the MoDOT Project Development Manual and MUTCD. The Design-Builder shall submit to USACE

preliminary sets of signing plans and signing specifications showing existing signing, signs to be removed or relocated, and proposed locations for new signing. These design submittals shall be in accordance with the requirements of Section 01012 of this Request for Proposal.

The Design-Builder shall design, furnish and install all signing on the project to provide guidance ensuring the safe and efficient movement of traffic. The Design-Builder shall prepare designs for signing that are consistent with current signing practice and in conformance with the Manual on Uniform Traffic Control Devices (MUTCD), 2000.

Non-standard signs shall be detailed on the signing plans following the layouts given in the above referenced documents.

6.14.2.1 Design Criteria

The materials utilized for delineation shall be installed per the MoDOT Standard Specifications.

Construction Signing shall be per Part VI of the Manual on Uniform Traffic Control Devices (MUTCD) and the guidelines found within the MoDOT Project Development Manual. Work Zone Traffic Control Plans shall be submitted to and approved by the USACE prior to implementation.

6.14.2.2 Signing

The Design-Builder shall develop a signing plan for the project, which includes all necessary signs for the mainline, and intersections including but not limited to guide, regulatory and warning signs. This plan shall also include signing for areas outside of the project limits that will be affected by the construction.

6.14.2.3 Sign Layout

Guide signs layouts shall be done in accordance with the latest revision of the MoDOT Signing Policy and Standards.

6.14.2.4 Design Plans

The design shall include a signing plan and sign specification sheets giving the location of the sign, the size of the sign, the legend of the sign, and the mounting type.

Prior to fabrication of any sign elements, a guide sign concept plan with proposed formats shall be submitted to the USACE for review. In addition, any modifications made to "R" and "W" series signs shall be submitted to the USACE for review.

6.14.2.5 Construction

Positive guidance by the use of existing, interim and new signing shall be provided for the traveling public at all times during construction to ensure safe and informed operation while traffic is maintained on the affected roadways. The traffic control plan submitted by the Design-Builder shall address the use of interim signing and pavement markings during the transition from existing to new signing.

6.14.3 Intersection Signalization

The Design-Builder shall prepare construction documents for installation of traffic signals. The Design-Builder shall design, furnish and construct traffic signals at the intersection of West Gate Access Road and Indiana/Pulaski Avenues. The Design-Builder shall design the intersection and traffic signals to optimize vehicle levels of service, minimize delay, and accommodate pedestrians, as necessary. The signals shall be constructed within existing right-of-way limits.

All preformed loop detection shall be placed in new pavement per MoDOT Standard Specifications and the Manual on Uniform Traffic Control Devices (MUTCD), 2001.

The Design-Builder shall upgrade existing electrical services, as needed, for the new signals. If a new or upgraded existing electrical service is needed, the Design-Builder shall coordinate with USACE and submit the necessary design information for the new or upgraded electrical service to the USACE Resident Engineer. USACE will obtain any Service Agreements from the electrical company once the Design-Builder submits the required information.

6.14.3.1 Design Criteria

Traffic signals shall be designed using the following criteria:

- A. The signal controller shall be a Type 170 B. Signals shall be furnished and installed per current MoDOT Design Standards and Standard Specifications and the MUTCD.
- B. The Design-Builder shall furnish and install all signal equipment. ALL signal equipment shall be new and conform to MoDOT standards and specifications and the MUTCD. The Design-Builder shall only use MoDOT pre-approved signal poles. No special pole designs shall be used for this project.

6.14.3.2 Design Plans

The Design-Builder shall prepare preliminary design plans for the traffic signals. The plans shall be drawn to MoDOT Standards. The plans shall include the following minimum information:

- A. Lane geometry, striping and queue lengths
- B. Signal pole locations
- C. Signal head locations
- D. Types of signal faces
- E. Controller location
- F. Power source
- G. Type and location of detection
- H. Pole and conductor schedule
- I. Wiring Diagrams
- J. Phasing Diagrams
- K. Standard Mounting Details

The Design-Builder shall submit the preliminary design for review as outlined in Section 01012 prior to purchasing equipment.

The 100% Design shall contain full plans as required to construct and operate the signalized intersections. This shall include all requirements for the efficient operation of the traffic signal.

6.14.3.3 Construction

The Design-Builder shall conduct burn-in and testing of all traffic signal hardware and assure its functionality prior to field installation.

The Design-Builder shall notify USACE fourteen (14) calendar days prior to scheduled start of operation of any traffic signal. The Design-Builder shall inspect the traffic signal installation. The start of operation of the traffic signal does not constitute final acceptance of the traffic signal installation. Final acceptance will be made after satisfactory field inspection by USACE staff and receipt of as-built documentation.

6.14.4 Work Zone Traffic Control

The Design-Builder shall prepare construction staging plans, detour plans and coordinate a Work Zone Traffic Control Meeting.

6.14.4.1 Construction Staging and Traffic Control Plans

The Design-Builder shall prepare construction staging plans, detour plans, site specific traffic control plans, and typical plans and details in accordance with the MoDOT Project Development Manual MUTCD, and other MoDOT provided information. Construction staging shall be developed, along with detour and signing plans. Construction signing and temporary illumination systems (if required) shall be shown on site specific traffic control plans.

Traffic control plans shall be approved by an engineer licensed in the State of Missouri with traffic expertise, prior to actual construction that will affect traffic. The Design-Builder shall submit a preliminary set of traffic control plans to the USACE Resident Engineer for review and comment 10 business days prior to implementation.

6.14.4.2 Detour Plans

The Design-Builder shall prepare any detour plans required for detouring Missouri Avenue and Pulaski Avenue onto local roadways. It shall be the Design-Builder's responsibility to obtain detour agreements from local agencies for use of local roadways for traffic detours. All detours shall have an asphalt or concrete pavement surface.

6.14.4.3 Work Zone Traffic Control Meeting

The Design-Builder shall schedule a Work Zone Traffic Control (WZTC) Meeting. At a minimum, the following personnel shall be invited to the Work Zone Traffic Control Meeting: 1) City of Waynesville, 2) Fort Leonard Wood, 3) all Emergency Services providers, 4) Local Law Enforcement, 5) MoDOT, and 6) USACE's Resident Engineer. The personnel invited to the WZTC Meeting shall be notified two weeks in advance of the Meeting. The Design-Builder shall document all issues discussed in the WZTC Meeting, and their respective solutions.

6.15 Right-of-Way/Easements

Easement within the boundaries of Fort Leonard Wood will require a permit that will be obtained from the USACE. Right-of-way/easement outside of the Fort Leonard Wood boundaries will be established and obtained by MoDOT. The preliminary right-of-way/easement shown is based on the toe of slope provided in the Design-Build documents. The final right-of-way/easement will be based on the final design footprint provided by the Design-Builder.

The Design-Builder will be responsible for the final right-of-way/easement determination and preparation of final right-of-way/easement plans. Right-of-way/easement coordinates and land areas shall be computed by the Design-Builder for use by the USACE.

The Design-Builder will be responsible for providing all final right-of-way/easement field surveys including monumentation posts as per MoDOT requirements. FLW will furnish and install the monumentation plaques at a later date.

6.15.1 Right-of-Way/Easement Requirements Determination

The Design-Builder shall determine the requirements for new right-of-way/easement rights. Right-of-way/easement rights can include, but are not limited to, new right of way, access rights, and slope or temporary construction easements.

The Design-Builder shall submit to USACE, in writing, the proposed right-of-way/easement requirements. The proposed right-of-way/easement requirements shall be submitted in triplicate to USACE for review and shall include the following:

- A. A letter indicating the project name, contract number, project location, originator of report (Firm's Name), submittal date and submittal type.
- B. A plan of sufficient scale and detail to show the existing and proposed roadway right-of-way and easements.
- C. Type of acquisition required including estimates of the final right-of-way/easement with enough definition to identify all ownerships that will be affected. The proposed requirements should be large enough to cover all possible right-of-way/easement needs for this project and the proposed future 4-lane roadway.

6.15.2 Right-of-Way/Easement Acquisition

Based on the requirements provided by the Design-Builder, USACE will:

- A. Approve final right-of-way/easement plans and associated documents prepared by the Design-Builder necessary for right-of-way acquisition
- B. Acquire necessary right-of-way/easement.
- C. Obtain the necessary authority to proceed with the various phases of property acquisition.
- D. Prepare the necessary data for project clearance letters.

6.16 Construction Specifications

The MoDOT Standard Specifications for Highway Construction 1999 (English Version), and all current Special Provisions, shall be used by the Design-Builder as a minimum requirement for materials and construction requirements modified as necessary by the Design-Builder to address project specific needs. The Design-Builder shall prepare the construction specifications for Materials and Construction items and procedures not adequately covered by MoDOT's Standard Specifications, maintaining or improving the level of quality represented therein. All references to the roles of the parties described in the Standard Specifications are understood to be as described in the Contract Provisions. Final construction specifications shall be prepared by (or under the direction of) a Professional Engineer registered in the State of Missouri. USACE will review and provide over-the-shoulder comments on all submittals of construction specifications. USACE has the right to reject construction specifications, if they do not meet the requirements described in the Scope of Work.

6.17 Cooperation between Contractors

The contractor's attention is directed to the MoDOT roadway contract on Route H that will be under construction within the duration of this project. This project is scheduled to be let in the Fall of 2002. The project will consist of grading, drainage, paving and bridges for a 5-lane highway from 0.2 miles north of I-44 to one mile south of I-44.

Other projects that could be occurring simultaneously with the West Gate Access Road project include, but may not be limited to the following:

- A. West Gate entrance including building, parking and additional lane paving (FLW)
- B. Overhead transmission relocation along existing Route H (Sho-Me Power)

Full cooperation of the contractors involved in these improvements, in careful and complete coordination of their respective activities in the area, will be required. Each contractor involved shall so schedule and conduct their work as to avoid unnecessary inconvenience and delay to another and shall conduct their work in such a manner as not to damage work being performed or completed by another. When necessary for proper execution of work, each contractor shall permit the other access through the overlapping areas.

The USACE shall not be responsible for any damages or claims arising because of inconvenience, delay or loss experienced, caused or contributed to by the Design-Builder because of the presence and operations of other contractors working within the limits on the same project. The Design-Builder, as well as other contractors, shall schedule and conduct work so as not to interfere with or cause unnecessary inconvenience or delay to their respective operations within the limits of the same project.

7.0 Contract Administration

The work in this contract shall be administered in accordance with this section of the Scope of Work.

7.1 United States Army Corps Of Engineers

USACE's Resident Engineer shall:

- A. Conduct ongoing reviews of the Design-Builder's progress in performing the work and ensure timely comments from the technical units.
- B. Review the Design-Builder's billings
- C. Review and evaluate the Design-Builder's requests for extension of time and supplemental agreements
- D. Review all correspondence with public agencies prior to the Design-Builder's mailing of any correspondence.
- E. Provide a single point of contact for all questions, requests, and submittals
- F. Coordinate project scheduling between the Design-Builder and USACE, coordinate USACE oversight of QA activities, and coordinate documentation reviews by USACE.
- G. Review and process progress payments
- H. Other duties as agreed upon by the Design-Builder and the USACE

7.2 Design-Builder

The Design-Builder shall:

- A. Establish, furnish and maintain suitable design and construction office facilities in the vicinity of the project, to serve as the project office for the duration of the project in the location specified in the Design-Builder's Technical Proposal.
- B. Maintain an adequate on-site staff of qualified support personnel to perform the work

necessary to complete the project.

- C. Establish internal accounting methods and procedures for documenting and monitoring project costs.
- D. Provide project costs as required to USACE for purposes of monitoring Design-Build pilot projects.
- E. Establish and maintain contract administration procedures, which shall include preparation of supplemental agreements and requests for time extensions as well as administration of subcontracts.
- F. Include the complete project name and number on all correspondence related to this contract.
- G. Participate in design consensus, status and team building meetings with all appropriate participants at the start, on a monthly basis during the project development period and as needed to maintain the design schedule. If requested by the USACE Resident Engineer, the Design-Builder shall act as the lead.
- H. Assume complete responsibility for the accuracy and completeness of Construction Documents and related design prepared under this project.
- I. Submit requests for progress payments along with the supporting documentation
- J. Other duties as agreed upon by the Design-Builder and USACE.

7.3 Pre-Construction Meeting and Construction Documentation

The Design-Builder is responsible for obtaining, maintaining, and monitoring for compliance all documents and records required in the contract provisions. Prior to start of construction work, a Coordination Meeting as specified in Section 01451, paragraph 3.3, shall be held to review quality control and documentation requirements.

7.4 Activity Meetings

Prior to the start of any work activity the Design-Builder shall hold an Activity Meeting to ensure that all project personnel have a thorough understanding of work to be done. Work activities generally correspond to the sections of the Standard Specifications, such as clearing and grubbing, earthwork, aggregate base, and asphalt/concrete paving, or a definable feature of work such as pre-paving conference, pre-pour conferences for bridge decks, etc. The Activity Meeting should include discussions relating to what will be accomplished, by whom it will be performed, and where, when, and how the work will be done. The Activity Meetings are to ensure that all parties have the same understanding of the design intent, have the appropriate plans, specifications and any special details, and are aware of safety regulations and procedures that need to be followed. At this time the QC inspection checklist for this activity should be reviewed. Activity Meetings shall be scheduled several days in advance of the actual work beginning on an activity to allow for additional preparation if necessary. The Activity Meetings shall be planned and conducted by the Design-Builder CQC System Manager. Minutes of the meeting shall be taken to document any clarifications and understandings related to the construction of the item that are not documented elsewhere. Activity Meetings are classified as Hold Points and shall be identified in the Design-Builder's QC plan.

Typical Activity Meeting Content

Scope (Design Criteria and Intent, Constraints)

Applicable Documents

Work Activity Outline and Schedule (What, Where, Who, When, and How)

- Staking Plan
- Safety Regulations and Procedures
- Traffic Control Plan
- Coordination with Utilities
- Inspection Plan/Quality Control Procedures
- Status of Submittals
- Acceptance Criteria
- Basis of Payment
- Examination of Work Area
- Examination of Stored Material
- Open Discussion

7.5 Design-Builder Sampling and Testing

Design-Builder field and laboratory sampling and testing shall be performed as specified in the MoDOT Standard Specifications and Material Manuals. Sampling and testing shall be performed by qualified testing personnel as defined in this section and in Section 01451, paragraph 3.4.3 of this Request for Proposal. Representative samples shall be randomly obtained by the Design-Builder at specified frequencies and locations as shown in Appendix E, Table 2. The Design-Builder shall furnish copies of all test results to USACE within 24 hours of acquiring the sample or the next day of business.

The Design-Builder shall provide to USACE a testing plan for each material as required by Section 01451, Contractor Quality Control. The testing plan shall be developed using the Random Numbers Table (Appendix E, Table 3) or a comparable random selection process such as ASTM D 3665 and reflect the proposed total project quantity. The sampling location and subplot quantity (testing lot quantity) shall be as shown in Appendix E, Table 2 for the material being tested.

Reference Section 01451, paragraph 3.7, of this Request for Proposal for additional testing requirements.

7.5.1 Testing Technicians

Testing technicians shall have a minimum of 2 years experience and have successfully completed the MoDOT Technician Certification Program as defined in the MoDOT Materials Manual (or approved equivalent). Technicians shall have completed Level 2 certification for testing procedures in soils, aggregates, asphalt and concrete. Additional requirements for testing personnel are defined in Section 01451, paragraph 3.4.3.

The testing technicians performing the field and laboratory sampling and testing shall be employed by the Design-Builder or agents laboratory and supervised by the CQC System Manager as described in Section 01451, paragraph 3.4.2.

7.5.2 Design-Builder Laboratories

All sampling and testing shall be performed by a laboratory that meets the requirements of Section 01451, paragraph 3.7.2 of this Request for Proposal.

7.5.3 Records

The Design-Builder shall prepare test reports as required by Section 01451, paragraph 3.7.1.e of this Request for Proposal. The Design-Builder shall also prepare, maintain, and submit to the Engineer completed test records and final materials certification in accordance with the requirements of the MoDOT Construction Manual .

7.5.4 Acceptance of Small Quantities of Materials

USACE may elect to accept small quantities of materials without normal sampling and testing frequencies. The determination to accept materials using this provision rests solely with USACE. Structural Concrete will not be considered under the small quantity definition.

USACE may use the acceptance criteria for small quantities stated in the MoDOT Pre-Acceptance List (PAL) of Materials and Sources.

Questions that the USACE will consider prior to use of small quantity acceptance are:

- A. Has the material been previously approved?
- B. Is the material certified?
- C. Is there a current mix design or reference design?
- D. Has it been recently tested with satisfactory results?
- E. Is the material structurally significant?

Small quantity acceptance may be accomplished by visual identification, material certification or other methods. Acceptance of small quantities of materials by these methods must be fully documented. Documentation of materials under these methods must be provided by the Design-Builder accepting the material. For visual documentation, an entry should be noted on field records with a statement as to the basis of acceptance of the material and approximate quantity involved.

Small quantity acceptance may be used for any proposal quantity of the following uses:

- A. Driveways
- B. Road approaches
- C. Paved ditches and slopes

7.5.5 Verification Sampling and Testing

USACE or its designated agent shall perform sampling and splitting of materials for verification testing. Verification samples shall be randomly obtained.

When the differences of certain attributes of a material between the Design-Builder's test results and USACE's verification test results exceed the values shown in Appendix E, table 1, placement of those materials shall be halted until the Design-Builder can demonstrate that the material is within the required specifications.

7.6 Quality Control Inspections

Quality control inspections shall be conducted by the Design-Builder as described in Section 01451, paragraph 3.6 of this Request for Proposal

7.6.1 Witness and Hold Points

Witness and Hold Points are to be established where notification of USACE is required for USACE's option of observing or visually examining a specific work operation or test. Witness Points are points identified within the inspection plan, which require notification of USACE. Work may proceed beyond a Witness Point with or without participation by USACE provided proper notification has been given. Hold Points are mandatory verification points identified within the inspection plan beyond which work cannot proceed until mandatory verification is performed and a written release is granted by USACE. Witness and Hold Points should be

identified in the construction process where critical characteristics are to be measured and maintained, and at points where it is nearly impossible to determine the adequacy of either materials or workmanship once work proceeds past this point. All Activity Meetings shall be included in the Design-Builder's CQC Plan as Hold Points.

7.6.2 Coordination and Notification

The Design-Builder shall designate a primary point of contact for notifications for inspection at Hold Points and Witness Points. An alternate individual may be designated to function in this capacity in his/her absence. USACE will also designate one individual to handle responses to the Design-Builder with written reports or releases for Hold Points and Witness Points.

The time necessary to respond to the notification for inspection at Hold and Witness Points shall be stated in the Design-Builder's CQC Plan and mutually agreed to by both the Design-Builder and USACE.

7.6.3 Hold Points

The following are mandatory Hold Points for inspections to be performed by USACE. The Design-Builder may wish to include others.

7.6.3.1 Bridges and Structures (including all foundations)

1. Prior to all concrete placements
 - a) USACE will check that the Design-Builder has completed the following:
 - (1) Documentation is present for rebar (Mill Cert. or Mfg. Cert.)
 - (2) Rebar clearances have been checked.
 - (3) Rebar size, spacing and splices have been checked.
 - (4) Roadway deck steel is properly supported
 - b) USACE will perform the following independent inspections or checks.
 - (1) Spot check deck steel for proper clearance to finish deck elevations
 - (2) Spot check form dimensions
 - (3) Check that concrete mix design has been reviewed by USACE
 - (4) Pre-placement meeting held
 - (5) Curing procedures agreed on and equipment available, including backups
2. Girders
 - a) USACE will perform the following independent inspections or checks.
 - (1) Check that girders have been inspected and released for shipment by USACE
 - (2) Spot check that camber of each has been field determined and properly calculated in final grades
3. For shaft foundations, USACE will review the Crosshole Sonic Logging (CSL) test results after the first shaft constructed at each bridge or wall to verify shaft integrity.

4. For spread footings and walls, USACE will inspect footing excavation base prior to concrete pour to verify that soil/rock encountered is consistent with the Geotechnical Report.

7.6.3.2 Pavements & Bridge Decks

1. Concrete: Pre-pour conference

The following elements will be discussed:

- a) Mix Design reviewed for conformance with specifications,
- b) Aggregate sources have proper qualifications i.e. LA Wear, gradation, etc.
- c) Proper equipment available, i.e. screed, broom and curing bridges
- d) Certifications have been received for each lot of curing compound
- e) Proper testing equipment available, beam molds, stinger, etc.
- f) Provisions for checking grade lines ahead of paving operation
- g) Station stamps available and layout properly marked
- h) Dowel bar and tie bar placement
- i) Emergency covering material available in case of sudden rain

2. Asphalt Paving: Pre-paving conference

The following elements will be discussed:

- a) Mix Design developed in conformance with specifications,
- b) Aggregate sources used have proper qualifications i.e. LA Wear, degradation, etc.
- c) Stockpile of tested aggregate necessary to pave the project
- d) QC sampling and testing by random method discussed
- e) Compaction test sites determined on random basis
- f) Traffic control
- g) Hours of operation
- h) Weather & surface temperature limitations
- i) Paving methods - pick up machine, trucks, material transfer devices
- j) Load limits
- k) Clear zones
- l) Adjust drainage apertures and utilities
- m) Tack Coat applications
- n) Statistical evaluation policies
- o) Options on use of rollers
- p) Grade control, transverse and longitudinally
- q) QC sampling and testing

7.6.4 Witness Points

The following are Witness Points for inspections or checks that USACE may elect to perform. The Design-Builder may wish to include others.

7.6.4.1 Pipe Installations

USACE shall be given the opportunity to check that the Design-Builder has completed the following, prior to backfilling the item:

1. Culverts
 - a) Compaction tests reports for bedding and backfill zones available
 - b) Material Certificates for materials where appropriate

7.6.4.2 Compaction

USACE shall be given the opportunity to check the following Design-Builder work:

1. Embankment
 - a) Compaction - minimum one test / lift
 - b) Optimum Moisture
2. Backfill Zones
 - a) Compaction - minimum one test / lift / installation
3. Surfacing
 - a) Compaction - minimum one test / lift

7.6.5 Performance Verification of Project Geotechnical Elements/Features

The Design-Builder's CQC plan shall include inspection and verification tests to determine the integrity of foundation structures and elements and to verify that their performance is as anticipated from the design. For drilled shaft foundations where water or slurry is present above the base of the shaft, Crosshole Sonic Logging (CSL) testing shall be conducted to verify the integrity of the shaft.

Walls shall be designed for expected total and differential settlements based on site geotechnical analyses. The Design-Builder's CQC plan shall include inspection, wall face tolerance and deflection measurements, and verification and proof tests for anchors and soil nails, to determine the integrity of foundation structures and wall elements, and to verify that the wall performance is as anticipated from the design.

The Design-Builder shall utilize geotechnical instrumentation as necessary and as recommended in the Geotechnical Report to verify the performance of areas of significant cuts or fills regarding deformation and stability, in particular where soft or otherwise unstable ground is present, or to control filling or cutting rates to maintain stability. An instrumentation and monitoring plan, including criteria, which will be used to determine acceptance, shall be included in the Design-Builder's CQC plan.

If soil densification or other foundation soil stabilization techniques are used, the Design-Builder's CQC plan shall address how the integrity and success of the soil densification technique will be investigated, monitored, and compared to the intended design.

7.6.6 Surveillance Inspection

USACE shall have the right to conduct surveillance inspection to verify the adequacy of the Design-Builder's inspection activities. Unacceptable work, whether the result of poor workmanship, use of defective materials, damage through carelessness or any other cause shall be removed immediately and replaced in an acceptable manner when found.

7.6.7 USACE Inspected and Tested Items

USACE using its own resources will provide inspection and testing of the following.

7.6.7.1 Fabrication Inspection

The inspection of project specific fabricated items will be accomplished by USACE using its own forces. To facilitate these inspections the Design-Builder will promptly notify USACE of the intended fabricator and provide two (2) copies of the "Approved" Shop Drawings. The fabricated items to be inspected, include but are not limited to the following:

1. Treated timber and lumber except guardrail post and blocks
2. Treated piling
3. Epoxy coated rebar
4. Anchor bolts shipment
5. Bridge bearings
6. Miscellaneous items that are shop welded
7. Miscellaneous galvanized steel items
8. Culvert pipe equal to or greater than 30" in diameter
9. Precast concrete panels
10. Prestressed concrete girders
11. Steel for bridges
12. Traffic signal and illumination standards
13. Utility vaults
14. Metal drainage castings

7.6.7.2 Electrical Systems

USACE electrical inspectors will conduct inspection of lighting and signalization electrical systems for acceptance. USACE's Electrical Inspectors will accomplish the inspection of the electrical circuitry.

The inspection of electrical items by the Design-Builder shall be limited to the following:

- A. Foundation for luminaries, signal poles, and service and controller cabinets,
- B. Erection of the luminaries and signal poles,
- C. Underground conduit placement and detector loop placement.

SECTION 01500A

TEMPORARY CONSTRUCTION FACILITIES
02/97

PART 1 GENERAL

1.1 BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN

1.1.1 Bulletin Board

Immediately upon beginning of work, the Contractor shall provide a weatherproof glass-covered bulletin board not less than 36 by 48 inches in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the contract, Wage Rate Information poster, and other information approved by the Contracting Officer. The bulletin board shall be located at the project site in a conspicuous place easily accessible to all employees, as approved by the Contracting Officer. Legible copies of the aforementioned data shall be displayed until work is completed. Upon completion of work the bulletin board shall be removed by and remain the property of the Contractor.

1.1.2 Project and Safety Signs

The requirements for the signs, their content, and location shall be as shown on the drawings. The signs shall be erected within 15 days after receipt of the notice to proceed. The data required by the safety sign shall be corrected daily, with light colored metallic or non-metallic numerals. Upon completion of the project, the signs shall be removed from the site.

1.2 PROTECTION AND MAINTENANCE OF TRAFFIC

During construction the Contractor shall provide access and temporary relocated roads as necessary to maintain traffic. The Contractor shall maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment and the work, and the erection and maintenance of adequate warning, danger, and direction signs, shall be as required by the State and local authorities having jurisdiction. The traveling public shall be protected from damage to person and property. The Contractor's traffic on roads selected for hauling material to and from the site shall interfere as little as possible with public traffic. The Contractor shall investigate the adequacy of existing roads and the allowable load limit on these roads. The Contractor shall be responsible for the repair of any damage to roads caused by construction operations.

1.2.1 Haul Roads

The Contractor shall, at its own expense, construct access and haul roads necessary for proper prosecution of the work under this contract. Haul roads shall be constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided. The Contractor shall provide necessary lighting, signs, barricades, and

distinctive markings for the safe movement of traffic. The method of dust control, although optional, shall be adequate to ensure safe operation at all times. Location, grade, width, and alignment of construction and hauling roads shall be subject to approval by the Contracting Officer. Lighting shall be adequate to assure full and clear visibility for full width of haul road and work areas during any night work operations. Upon completion of the work, haul roads designated by the Contracting Officer shall be removed.

1.2.2 Barricades

The Contractor shall erect and maintain temporary barricades to limit public access to hazardous areas. Such barricades shall be required whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Barricades shall be securely placed, clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

1.3 CONTRACTOR'S TEMPORARY FACILITIES

1.3.1 Administrative Field Offices

The Contractor shall provide and maintain administrative field office facilities within the construction area at the designated site. Government office and warehouse facilities will not be available to the Contractor's personnel.

1.3.2 Storage Area

If the trailer and storage area are located at the east end of the project visible from Indiana Avenue, the Contractor shall construct a temporary 6 foot high chain link fence around trailers and materials. The fence shall include plastic strip inserts, colored brown, so that visibility through the fence is obstructed. Fence posts may be driven, in lieu of concrete bases, where soil conditions permit. Trailers, materials, or equipment shall not be placed or stored outside the fenced area unless such trailers, materials, or equipment are assigned a separate and distinct storage area by the Contracting Officer away from the vicinity of the construction site but within the military boundaries. Trailers, equipment, or materials shall not be open to public view with the exception of those items which are in support of ongoing work on any given day. Materials shall not be stockpiled outside the fence in preparation for the next day's work. Mobile equipment, such as tractors, wheeled lifting equipment, cranes, trucks, and like equipment, shall be parked within the fenced area at the end of each work day.

1.3.3 Supplemental Storage Area

Upon Contractor's request, the Contracting Officer will designate another or supplemental area for the Contractor's use and storage of trailers, equipment, and materials. This area may not be in close proximity of the construction site but shall be within the military boundaries. Fencing of materials or equipment will not be required at this site; however, the Contractor shall be responsible for cleanliness and orderliness of the area used and for the security of any material or equipment stored in this area. Utilities will not be provided to this area by the Government.

1.3.4 Appearance of Trailers

Trailers utilized by the Contractor for administrative or material storage purposes shall present a clean and neat exterior appearance and shall be in a state of good repair. Trailers which, in the opinion of the Contracting Officer, require exterior painting or maintenance will not be allowed on the military property.

1.3.5 Maintenance of Storage Area

Fencing shall be kept in a state of good repair and proper alignment. Should the Contractor elect to traverse, with construction equipment or other vehicles, grassed or unpaved areas which are not established roadways, such areas shall be covered with a layer of gravel as necessary to prevent rutting and the tracking of mud onto paved or established roadways; gravel gradation shall be at the Contractor's discretion. Grass located within the boundaries of the construction site shall be mowed for the duration of the project. Grass and vegetation along fences, buildings, under trailers, and in areas not accessible to mowers shall be edged or trimmed neatly.

1.3.6 New Building

Any new building erected for a temporary field office shall be maintained by the Contractor during the life of the contract and upon completion and acceptance of the work shall become the property of the Contractor and shall be removed from the site.

1.3.7 Security Provisions

Adequate outside security lighting shall be provided at the Contractor's temporary facilities. The Contractor shall be responsible for the security of its own equipment; in addition, the Contractor shall notify the appropriate law enforcement agency requesting periodic security checks of the temporary project field office.

The Government will allow the Contractor access to the west-end of the project for construction of the project. The Government will provide security for the Government designated location of the gate, for granting access on and off the boundaries of Fort Leonard Wood, Missouri. This includes security for transporting explosives when on Fort Leonard Wood, Missouri, property. The Government's providing of security does not relieve the Contractor from providing security for its own property, etc., as stated in this RFP.

1.4 ACCOMMODATIONS FOR GOVERNMENT INSPECTORS

The Contractor shall furnish a temporary office facility with a minimum of 600 square feet of floor space. It shall be located where directed and shall be reserved for Government personnel only. Drinking water facilities, adequate lighting, local commercial telephone service, air conditioning, heating equipment, and a toilet room with water closet, hot and cold water in the lavatory with sewage facilities shall be furnished and maintained by the Contractor. The office shall be furnished with two legal size filing cabinets with four drawers, one drafting table with stool, one plan rack, two desks with desk chairs, one eight foot work table, and eight chairs. Used furniture, in good condition, will be acceptable. Entrance doors shall be equipped with a substantial lock. The Contractor shall provide janitor service, fuel for the heating facilities, electricity, telephone and water, all at no cost to the Government, except

the Contractor will not be liable for Government long-distance calls. The telephone shall consist of separate voice, fax and data lines. Depending on the location of the temporary office location, the data line may be connected to the Fort Leonard Wood data system with all required connection equipment furnished by the Contractor (e.g. of (2) Two Pairga in CAMPU-RS-Desktop units). In the event the temporary location is not in an area accessible to the Fort Leonard Wood system, the Contractor shall furnish the equipment required for that data access. The entire facility, including furniture, will remain the property of the Contractor and shall be removed from the site after completion of the contract.

1.5 PLANT COMMUNICATION

Whenever the Contractor has the individual elements of its plant so located that operation by normal voice between these elements is not satisfactory, the Contractor shall install a satisfactory means of communication, such as telephone or other suitable devices. The devices shall be made available for use by Government personnel.

1.6 CLEANUP

Construction debris, waste materials, packaging material and the like shall be removed from the work site daily. Any dirt or mud which is tracked onto paved or surfaced roadways shall be cleaned away. Materials resulting from demolition activities which are salvageable shall be stored within the fenced area described above or at the supplemental storage area. Stored material not in trailers, whether new or salvaged, shall be neatly stacked when stored.

1.7 RESTORATION OF STORAGE AREA

Upon completion of the project and after removal of trailers, materials, and equipment from within the fenced area, the fence shall be removed and will become the property of the Contractor. Areas used by the Contractor for the storage of equipment or material, or other use, shall be restored to the original or better condition. Gravel used to traverse grassed areas shall be removed and the area restored to its original condition, including top soil and seeding as necessary.

-- End of Section --

SECTION 01780A

CLOSEOUT SUBMITTALS

11/99

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Records

As-Built Contract Drawings; GA-RE.

Drawings showing final as-built conditions of the project. The final CADD as-built drawings shall consist of one set of electronic CADD drawing files in the specified format, one set of mylar drawings, and two sets of the approved red-line as-built drawings.

As-Built Shop Drawings; GA-RE.

As-Built Shop Drawings: Upon completion of the work under this contract, the Contractor shall furnish five complete sets or one complete set of reproducibles of all shop drawings as finally approved. These drawings shall show all changes and revisions made up to the time the equipment is completed and accepted. The quality of thereprocidbles and prints is subject to approval.

SD-03 Product Data

As-Built Record of Equipment and Materials; GA-RE.

Two copies of the record listing the as-built materials and equipment incorporated into the construction of the project.

Warranty Management Plan; GA-RE.

One set of the warranty management plan containing information relevant to the warranty of materials and equipment incorporated into the construction project, including the starting date of warranty of construction. The Contractor shall furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.

Warranty Tags; GA-RE.

Two record copies of the warranty tags showing the layout and design.

Final Cleaning; GA-RE.

Two copies of the listing of completed final clean-up items.

1.2 PROJECT RECORD DOCUMENTS

1.2.1 As-Built Drawings

This paragraph covers as-built drawings complete, as a requirement of the contract. The terms "drawings," "contract drawings," "drawing files," "working as-built drawings" and "final as-built drawings" refer to contract drawings which are revised to be used for final as-built drawings.

1.2.1.1 Government Furnished Materials

One set of electronic CADD files in the specified software and format revised to reflect all bid amendments will be provided by the Government at the preconstruction conference for projects requiring CADD file as-built drawings.

1.2.1.2 Working As-Built and Final As-Built Drawings

The Contractor shall revise 3 sets of paper drawings by red-line process to show the as-built conditions during the prosecution of the project. These working as-built marked drawings shall be kept current on a weekly basis and at least one set shall be available on the jobsite at all times. Changes from the contract plans which are made in the work or additional information which might be uncovered in the course of construction shall be accurately and neatly recorded as they occur by means of details and notes.

Final as-built drawings shall be prepared after the completion of each definable feature of work as listed in the Contractor Quality Control Plan (Foundations, Utilities, Structural Steel, etc., as appropriate for the project). The working as-built marked prints and final as-built drawings will be jointly reviewed for accuracy and completeness by the Contracting Officer and the Contractor prior to submission of each monthly pay estimate. If the Contractor fails to maintain the working and final as-built drawings as specified herein, the Contracting Officer will deduct from the monthly progress payment an amount representing the estimated cost of maintaining the as-built drawings. This monthly deduction will continue until an agreement can be reached between the Contracting Officer and the Contractor regarding the accuracy and completeness of updated drawings. The working and final as-built drawings shall show, but shall not be limited to, the following information:

a. The actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, the as-built drawings shall show, by offset dimensions to two permanently fixed surface features, the end of each run including each change in direction. Valves, splice boxes and similar appurtenances shall be located by dimensioning along the utility run from a reference point. The average depth below the surface of each run shall also be recorded.

b. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.

c. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor; including but not limited to fabrication, erection,

installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.

d. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.

e. Changes or modifications which result from the final inspection.

f. Where contract drawings or specifications present options, only the option selected for construction shall be shown on the final as-built prints.

g. If borrow material for this project is from sources on Government property, or if Government property is used as a spoil area, the Contractor shall furnish a contour map of the final borrow pit/spoil area elevations.

h. Modifications (change order price shall include the Contractor's cost to change working and final as-built drawings to reflect modifications) and compliance with the following procedures.

- (1) Directions in the modification for posting descriptive changes shall be followed.
- (2) A Modification Circle shall be placed at the location of each deletion.
- (3) For new details or sections which are added to a drawing, a Modification Circle shall be placed by the detail or section title.
- (4) For minor changes, a Modification Circle shall be placed by the area changed on the drawing (each location).
- (5) For major changes to a drawing, a Modification Circle shall be placed by the title of the affected plan, section, or detail at each location.
- (6) For changes to schedules or drawings, a Modification Circle shall be placed either by the schedule heading or by the change in the schedule.
- (7) The Modification Circle size shall be 12.7 mm diameter unless the area where the circle is to be placed is crowded. Smaller size circle shall be used for crowded areas.

1.2.1.3 Drawing Preparation

The as-built drawings shall be modified as may be necessary to correctly show the features of the project as it has been constructed by bringing the contract set into agreement with approved working as-built prints, and adding such additional drawings as may be necessary. These working as-built marked prints shall be neat, legible and accurate. These drawings are part of the permanent records of this project and shall be returned to the Contracting Officer after approval by the Government. Any drawings damaged or lost by the Contractor shall be satisfactorily replaced by the Contractor at no expense to the Government.

1.2.1.4 Computer Aided Design and Drafting (CADD) Drawings

Only personnel trained with a minimum of 3 years in the preparation of

Bentley CADD drawings and the Tri-service Standards shall be employed to modify the contract drawings or prepare additional new drawings. Additions and corrections to the contract drawings shall be equal in quality and detail to that of the originals. Line colors, line weights, lettering, layering conventions, and symbols shall be the same as the original line colors, line weights, lettering, layering conventions and symbols. If additional drawings are required, they shall be prepared using the specified electronic file format applying the same graphic standards specified for original drawings. The Contractor will be provided a copy of the Tri-Service CADD Standards to facilitate his efforts in the maintenance of design files. The title block and drawings border to be used for any new final as-built drawings shall be identical to that used on the contract drawings. Additions and corrections to the contract drawings shall be accomplished using CADD files. The electronic files will be supplied on compact disc, read-only memory (CD-ROM). The Contractor shall be responsible for providing all program files and hardware necessary to prepare final as-built drawings. The Contracting Officer will review final as-built drawings for accuracy and the Contractor shall make required corrections, changes, additions, and deletions.

a. The Contract Drawing files shall have all changes made on the layer/level as the original item being revised, deleted or added to.

b. When final revisions have been completed, the cover sheet drawing shall show the wording "RECORD DRAWING AS-BUILT" followed by the name of the Contractor in letters at least 5 mm high. All other contract drawings shall be marked either "As-Built" drawing denoting no revisions on the sheet or "Revised As-Built" denoting one or more revisions. Original contract drawings shall be dated in the revision block.

c. Within 20 days after Government approval of all of the working as-built drawings for a phase of work, the Contractor shall prepare the final CADD as-built drawings for that phase of work and submit two sets of blue-lined prints of these drawings for Government review and approval. The Government will promptly return one set of prints annotated with any necessary corrections. Within 10 days the Contractor shall revise the CADD files accordingly at no additional cost and submit one set of final prints for the completed phase of work to the Government. Within 20 days of substantial completion of all phases of work, the Contractor shall submit the final as-built drawing package for the entire project. The submittal shall consist of one set of electronic files on compact disc, read-only memory (CD-ROM), one set of 3 mil, digital, erasable 24-inch by 36-inch mylars, a sheet index showing sufficient planimetric data to indicate the geographical location of the project, and two sets of the approved red-line as-built drawings. They shall be complete in all details and identical in form and function to the contract drawing files supplied by the Government.

Any transactions or adjustments necessary to accomplish this is the responsibility of the Contractor. The Government reserves the right to reject any drawing files it deems incompatible with the customer's CADD system. Paper prints, drawing files and storage media submitted will become the property of the Government upon final approval. Failure to submit final as-built drawing files and marked prints as specified shall be cause for withholding any payment due the Contractor under this contract. Approval and acceptance of final as-built drawings shall be accomplished before final payment is made to the Contractor.

1.2.1.5 Payment

No separate payment will be made for as-built drawings required under this

contract, and all costs accrued in connection with such drawings shall be considered a subsidiary obligation of the Contractor.

1.2.2 As-Built Record of Equipment and Materials

The Contractor shall furnish one copy of preliminary record of equipment and materials used on the project 15 days prior to final inspection. This preliminary submittal will be reviewed and returned 2 days after final inspection with Government comments. Two sets of final record of equipment and materials shall be submitted 10 days after final inspection. The designations shall be keyed to the related area depicted on the contract drawings. The record shall list the following data:

RECORD OF DESIGNATED EQUIPMENT AND MATERIALS DATA

Description	Specification Section	Manufacturer and Catalog, Model, and Serial Number	Composition and Size	Where Used
-------------	--------------------------	---	-------------------------	---------------

1.2.3 Final Approved Shop Drawings

The Contractor shall furnish final approved project shop drawings 30 days after transfer of the completed facility.

1.2.4 Construction Contract Specifications

The Contractor shall furnish final as-built construction contract specifications, including modifications thereto, 30 days after transfer of the completed facility.

1.2.5 Real Property Equipment

The Contractor shall furnish a list of installed equipment furnished under this contract. The list shall include all information usually listed on manufacturer's name plate. The "EQUIPMENT-IN-PLACE LIST" shall include, as applicable, the following for each piece of equipment installed: description of item, location (by room number), model number, serial number, capacity, name and address of manufacturer, name and address of equipment supplier, condition, spare parts list, manufacturer's catalog, and warranty. A draft list shall be furnished at time of transfer. The final list shall be furnished 30 days after transfer of the completed facility.

1.2.6 Monthly As-Built Review Meeting

A monthly as-built review meeting will be conducted during the construction project. Each member of the construction team will attend the meeting and provide information or documentation as required. The meeting will be conducted in a mutually agreed upon location. To minimize difficulty in coordinating schedules, efforts will be made for a standing meeting in the same location, at the same time, and on the same day of the week each month.

- a. The Government will chair the meeting and serve as the information conduit.
- b. The Government will provide an agenda for the meeting.
- c. The Contractor shall bring two updated CDs (or diskettes) to the meeting.
- d. The Contractor shall bring current redline drawings to the meeting.

e. The Contractor shall display updated CADD as-built files on screen, demonstrating that CADD files match features on redline drawings, and making changes if necessary.

f. The Contractor shall leave one CD (or diskette) with the Government. The Contractor shall have updated this copy to include any changes made during the meeting.

g. The Contractor shall ensure that all design/construction and environmental drawings are in the Bentley Microstation DGN file format, compatible with Ft. Leonard Wood's CADD system, that they follow the Release 1.8 of the Tri-Service CADD Standard, that an electronic copy of the above mentioned standard is furnished, and that all submittals are delivered on CD-ROM or 1.44 MB diskettes.

h. For features exterior to primary facilities, the Government shall ensure the design file, working units and Cartesian coordinates allow for graphics to be geographically located in the Universal Traverse Macerator (UTM) zone 15 datum.

1.3 WARRANTY MANAGEMENT

1.3.1 Warranty Management Plan

The Contractor shall develop a warranty management plan which shall contain information relevant to the clause Warranty of Construction in Section 00800. At least 30 days before the planned pre-warranty conference, the Contractor shall submit the warranty management plan for Government approval. The warranty management plan shall include all required actions and documents to assure that the Government receives all warranties to which it is entitled. The plan shall be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below shall include due date and whether item has been submitted or was accomplished. Warranty information made available during the construction phase shall be submitted to the Contracting Officer for approval prior to each monthly pay estimate. Approved information shall be assembled in a binder and shall be turned over to the Government upon acceptance of the work. The construction warranty period shall begin on the date of project acceptance and shall continue for the full product warranty period. A joint 4 month and 9 month warranty inspection shall be conducted, measured from time of acceptance, by the Contractor, Contracting Officer and the Customer Representative. Information contained in the warranty management plan shall include, but shall not be limited to, the following:

a. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the Contractors, subcontractors, manufacturers or suppliers involved.

b. Listing and status of delivery of all Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and for all commissioned systems such as fire protection and alarm systems, sprinkler systems, lightning protection systems, etc.

c. A list for each warranted equipment, item, feature of construction or system indicating:

1. Name of item.
2. Model and serial numbers.
3. Location where installed.

4. Name and phone numbers of manufacturers or suppliers.
5. Names, addresses and telephone numbers of sources of spare parts.
6. Warranties and terms of warranty. This shall include one-year overall warranty of construction. Items which have extended warranties shall be indicated with separate warranty expiration dates.
7. Cross-reference to warranty certificates as applicable.
8. Starting point and duration of warranty period.
9. Summary of maintenance procedures required to continue the warranty in force.
10. Cross-reference to specific pertinent Operation and Maintenance manuals.
11. Organization, names and phone numbers of persons to call for warranty service.
12. Typical response time and repair time expected for various warranted equipment.

d. The Contractor's plans for attendance at the 4 and 9 month post-construction warranty inspections conducted by the Government.

e. Procedure and status of tagging of all equipment covered by extended warranties.

f. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

1.3.2 Performance Bond

The Contractor's Performance Bond shall remain effective throughout the construction period and through the one-year project warranty period.

a. In the event the Contractor fails to commence and diligently pursue any construction warranty work required, the Contracting Officer will have the work performed by others, and after completion of the work, will charge the remaining construction warranty funds of expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.

b. In the event sufficient funds are not available to cover the construction warranty work performed by the Government at the Contractor's expense, the Contracting Officer will have the right to recoup expenses from the bonding company.

c. Following oral or written notification of required construction warranty repair work, the Contractor shall respond in a timely manner. Written verification will follow oral instructions. Failure of the Contractor to respond will be cause for the Contracting Officer to proceed against the Contractor.

1.3.3 Pre-Warranty Conference

Prior to contract completion, and at a time designated by the Contracting Officer, the Contractor shall meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of this section. Communication procedures for Contractor notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Contracting Officer for the execution of the construction warranty shall be

established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, the Contractor shall furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue construction warranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warranted construction, shall be continuously available, and shall be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of its responsibilities in connection with other portions of this provision.

1.3.4 Contractor's Response to Construction Warranty Service Requirements

Following oral or written notification by the Contracting Officer, the Contractor shall respond to construction warranty service requirements in accordance with the "Construction Warranty Service Priority List" and the three categories of priorities listed below. The Contractor shall submit a report on any warranty item that has been repaired during the warranty period. The report shall include the cause of the problem, date reported, corrective action taken, and when the repair was completed. If the Contractor does not perform the construction warranty within the timeframes specified, the Government will perform the work and backcharge the construction warranty payment item established.

a. First Priority Code 1. Perform onsite inspection to evaluate situation, and determine course of action within 4 hours, initiate work within 6 hours and work continuously to completion or relief.

b. Second Priority Code 2. Perform onsite inspection to evaluate situation, and determine course of action within 8 hours, initiate work within 24 hours and work continuously to completion or relief.

c. Third Priority Code 3. All other work to be initiated within 3 work days and work continuously to completion or relief.

d. The "Construction Warranty Service Priority List" is as follows:

Code 1-Air Conditioning Systems

- (1) Recreational support.
- (2) Air conditioning leak in part of building, if causing damage.
- (3) Air conditioning system not cooling properly.

Code 1-Doors

- (1) Overhead doors not operational, causing a security, fire, or safety problem.
- (2) Interior, exterior personnel doors or hardware, not functioning properly, causing a security, fire, or safety problem.

Code 3-Doors

- (1) Overhead doors not operational.
- (2) Interior/exterior personnel doors or hardware not functioning properly.

Code 1-Electrical

- (1) Power failure (entire area or any building operational after 1600 hours).
- (2) Security lights
- (3) Smoke detectors

Code 2-Electrical

- (1) Power failure (no power to a room or part of building).
- (2) Receptacle and lights (in a room or part of building).

Code 3-Electrical

Street lights.

Code 1-Gas

- (1) Leaks and breaks.
- (2) No gas to family housing unit or cantonment area.

Code 1-Heat

- (1). Area power failure affecting heat.
- (2). Heater in unit not working.

Code 2-Kitchen Equipment

- (1) Dishwasher not operating properly.
- (2) All other equipment hampering preparation of a meal.

Code 1-Plumbing

- (1) Hot water heater failure.
- (2) Leaking water supply pipes.

Code 2-Plumbing

- (1) Flush valves not operating properly.
- (2) Fixture drain, supply line to commode, or any water pipe leaking.
- (3) Commode leaking at base.

Code 3 -Plumbing

Leaky faucets.

Code 3-Interior

- (1) Floors damaged.
- (2) Paint chipping or peeling.
- (3) Casework.

Code 1-Roof Leaks

Temporary repairs will be made where major damage to property is occurring.

Code 2-Roof Leaks

Where major damage to property is not occurring, check for location of leak during rain and complete repairs on a Code 2 basis.

Code 2-Water (Exterior)

No water to facility.

Code 2-Water (Hot)

No hot water in portion of building listed.

Code 3-All other work not listed above.

1.3.5 Warranty Tags

At the time of installation, each warranted item shall be tagged with a durable, oil and water resistant tag approved by the Contracting Officer. Each tag shall be attached with a copper wire and shall be sprayed with a silicone waterproof coating. The date of acceptance and the QC signature

shall remain blank until project is accepted for beneficial occupancy. The tag shall show the following information.

- a. Type of product/material_____.
- b. Model number_____.
- c. Serial number_____.
- d. Contract number_____.
- e. Warranty period_____from_____to_____.
- f. Inspector's signature_____.
- g. Construction Contractor_____.
- Address_____.
- Telephone number_____.
- h. Warranty contact_____.
- Address_____.
- Telephone number_____.
- i. Warranty response time priority code_____.
- j. WARNING - PROJECT PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE DURING THE WARRANTY PERIOD.

1.4 MECHANICAL TESTING, ADJUSTING, BALANCING, AND COMMISSIONING

Prior to final inspection and transfer of the completed facility; all reports, statements, certificates, and completed checklists for testing, adjusting, balancing, and commissioning of mechanical systems shall be submitted to and approved by the Contracting Officer as specified in applicable technical specification sections.

1.5 OPERATION AND MAINTENANCE MANUALS

Operation manuals and maintenance manuals shall be submitted as specified. Operation manuals and maintenance manuals provided in a common volume shall be clearly differentiated and shall be separately indexed.

1.6 FINAL CLEANING

The premises shall be left broom clean. Debris shall be removed from drainage systems. Equipment and fixtures shall be cleaned to a sanitary condition. Paved areas shall be swept and landscaped areas shall be raked clean. The site shall have waste, surplus materials, and rubbish removed. The project area shall have temporary structures, barricades, project signs, and construction facilities removed. A list of completed clean-up items shall be submitted on the day of final inspection.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

-- End of Section --

APPENDIX - F

**Bridge Memorandum
and TS&L Drawings**

BRIDGE MEMORANDUM

Sheet 1 of 1

DIST. 9

BRIDGE NO. --

JOB NO. --

STATION CL Bent 2 Sta. 164 + 92.53

PROJECT ROUTE --

DATE 12/13/20001

Pulaski COUNTY

ROUTE West Gate Access Road

OVER Roubidoux Creek

FINAL LAYOUT 100'-120'-93'-93'-93' Prestressed Concrete I-Girders

SKEW 22 ° Right Ahead

GRADE -0.5%, P.V.T. Sta. 160+50.00 Elev. 823.23

FILL EXCEPTION Sta. 163+91.18± Sta. 168+93.87± ALIGNMENT Tangent on structure

BEGINNING STATION 163+91.18 LOADING HS20 modified, with alternate military

PRESENT BRIDGE None

TRAFFIC HANDLING None Required

RIGHT-OF-WAY REQUIRED No Extra Required for Bridge

ROADWAY WIDTH: 36'-0" Unsymmetrical (2 lanes at 12'+1-8' shoulder and 1-4' shoulder) + 2-16" Safety Barrier Curbs

GENERAL NOTES:

Skew: 22° Right Ahead (All bents parallel)

Bent 2 – Sta. Tie Sta. 164 + 92.53

Design span lengths measured along CL Eastbound West Gate Access Road

Cross-slope data: -2% each lane from profile grade

Profile Grade and Stationing at CL Eastbound West Gate Access Road

Guardrails required at each end of bridge (Roadway item)

Slope Protection – 2'-0" rock blanket at each end bent (Roadway item)

Provide 25'-0" Approach Slabs at ends of bridge. (Bridge item)

Use System G (Gray) coating on structural steel.

Use typical 4"x8" slab drains, as required.

Design Speed = 50 mph

Design Year (2022) – ADT= 27,710; ADTT= 2,771

Utilities on the bridge are not required.

Roadway lighting supports are **not** required.

Substructure: End Bents – Integral; Intermediate Bents – Open Concrete

Wingwall lengths are: 24'-0" (End Bent 1 North)

24'-0" (End Bent 1 South)

24'-0" (End Bent 6 North)

24'-0" (End Bent 6 South)

Hydrologic Information:

Terrain is rolling.

Drainage Area = 295.0 sq. mi.

Design Frequency = 100 year

Design Discharge = 31,500 cfs

Design High Water Elev. = 802.79 ft.

Estimated Backwater = 0.95 ft.

Overtopping Frequency = > 500 year

Floodplain Development Permit is required.

Revetment/slope: Rock Blanket Slope Protection at End Bents

End Fills: Earth Fill at End Bents, 3:1

From Bridge Office Date _____

From District Office Date _____

From Design-Builder Date _____

Construction Cost Estimate _____

Date _____

HYDROLOGIC DATA

Drainage Area = 295 sq. mi.
Design Frequency = 100 yr.
Design Discharge = 31,500 cfs
Average Design Velocity = 7.56 fps
Design High Water Elev. = 802.79 ft.
Design Backwater = 0.95 ft.
Ordinary High Water Elevation = 786.9 ft.

- BENCHMARKS
1. B.M. - FLW BH 46
Brass cap set in concrete on the East Side of Iowa Avenue,
east of Fortney, Army Airfield.
Elev. = 1158.12

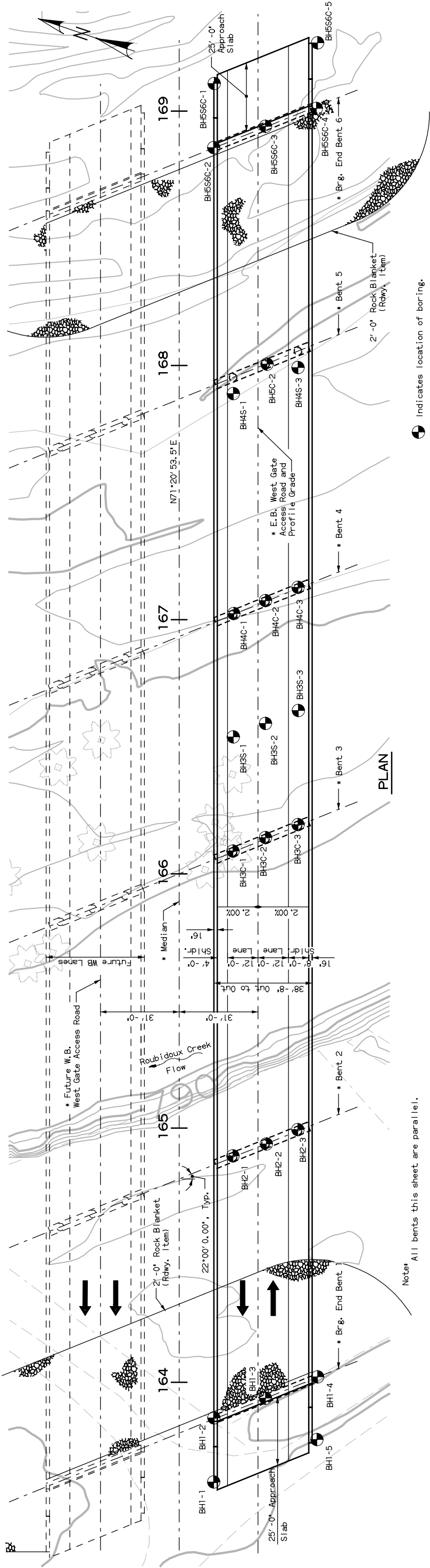
2. B.M. - FLW BH 85 - Range 4
Brass cap set in concrete on the north side of asphalt road,
west of a gravel drive, north of Range 4
Elev. = 1158.98



PROFILE GRADE

Notes

For Typical Boring details, see Sheet No. 57.

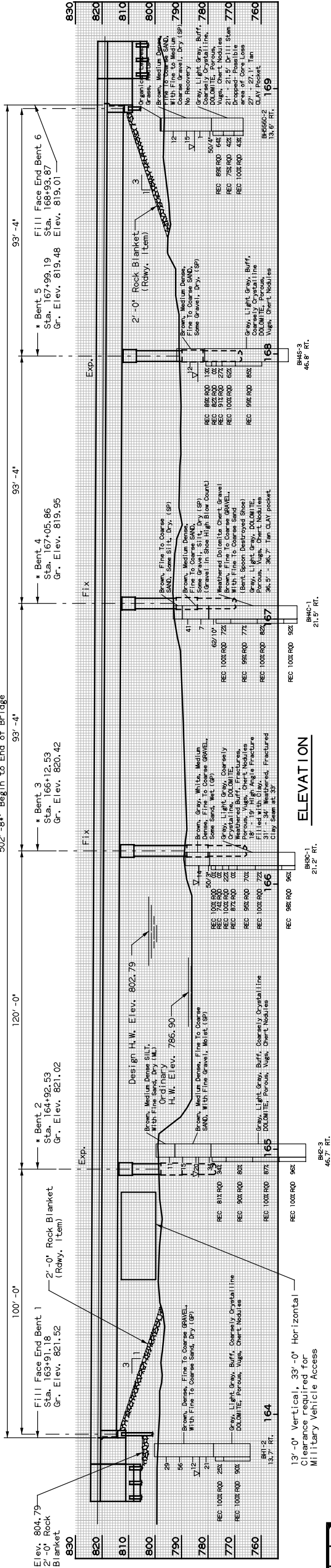


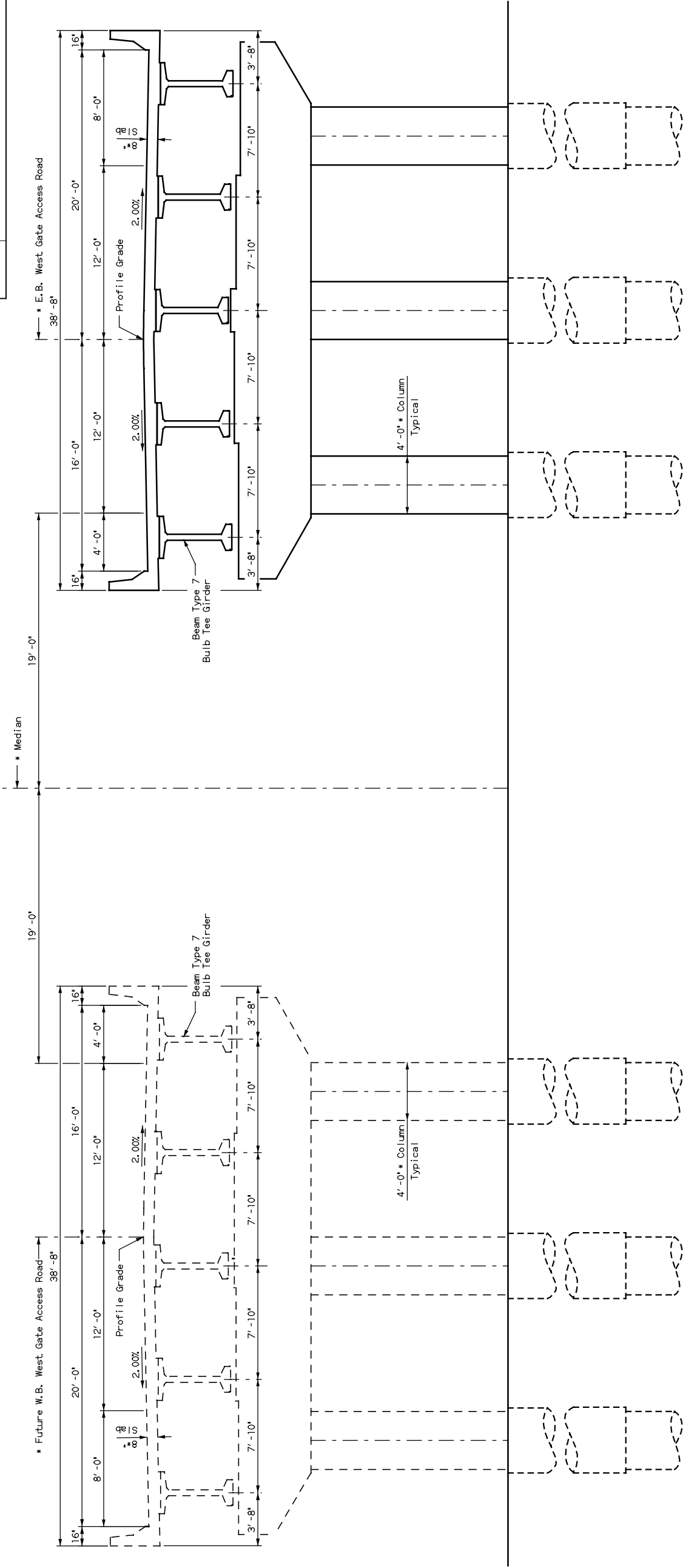
Notes

All bents this sheet are parallel.

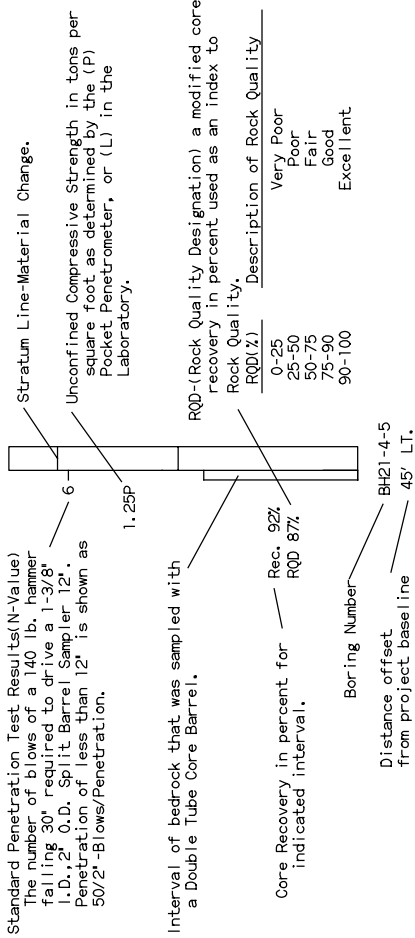
Indicates location of boring.

(100' - 120' - 93' - 4" - 93' - 4" - 93' - 4") Prestressed Concrete I-Girders
Skew 22°00'00.0" Right Ahead
502' - 8" Begin to End of Bridge

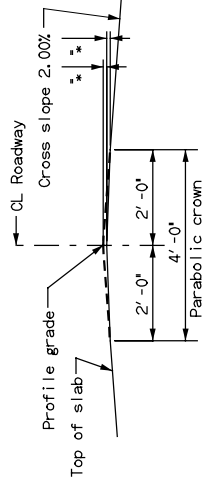




TYPICAL BORING



TYPICAL SECTION



TYPICAL PARABOLIC ROUNDING AT CROWN

BRIDGE MEMORANDUM

Sheet 1 of 1

DIST. 9

BRIDGE NO. --

JOB NO. --

STATION CL Bent 2 Sta. 164 + 92.53

PROJECT ROUTE --

DATE 12/13/20001

Pulaski COUNTY

ROUTE West Gate Access Road

OVER Roubidoux Creek

FINAL LAYOUT 100'-165'135'100' Continuous Composite Plate Girders

SKEW 22 ° Right Ahead

GRADE -0.5%, P.V.T. Sta. 160+ 50.00 Elev. 823.23

FILL EXCEPTION Sta. 163+ 91.18± Sta. 168+ 93.87± ALIGNMENT Tangent on structure

BEGINNING STATION 163+ 91.18 LOADING HS20 modified, with alternate military

PRESENT BRIDGE None

TRAFFIC HANDLING None Required

RIGHT-OF-WAY REQUIRED No Extra Required for Bridge

ROADWAY WIDTH: 36'-0" (2 lanes at 12' + 1-8' shoulder and 1-4' shoulder) + 2-16" Safety Barrier Curbs

GENERAL NOTES:

Skew: 22° Right Ahead (All bents parallel)

Bent 2 – Sta. Tie Sta. 164 + 92.53

Design span lengths measured along CL Eastbound West Gate Access Road

Cross-slope data: -2% each lane from profile grade

Profile Grade and Stationing at CL Eastbound West Gate Access Road

Guardrails required at each end of bridge (Roadway item)

Slope Protection – 2'-0" rock blanket at each end bent (Roadway item)

Provide 25'-0" Approach Slabs at ends of bridge. (Bridge item)

Use System G (Gray) coating on structural steel, unless weathering steel is used.

Use typical 4"x8" slab drains, as required.

Design Speed = 50 mph

Design Year (2022) – ADT= 27,710; ADTT= 2,771

Utilities on the bridge are not required.

Roadway lighting supports are **not** required.

Substructure: End Bents – Integral; Intermediate Bents – Open Concrete

Wingwall lengths are: 24'-0" (End Bent 1 North)

24'-0" (End Bent 1 South)

24'-0" (End Bent 5 North)

24'-0" (End Bent 5 South)

Hydrologic Information:

Terrain is rolling.

Drainage Area = 295.0 sq. mi.

Design Frequency = 100 year

Design Discharge = 31,500 cfs

Design High Water Elev. = 802.81 ft.

Estimated Backwater = 0.91 ft.

Overtopping Frequency = > 500 year

Floodplain Development Permit is required.

Revetment/slope: Rock Blanket Slope Protection at End Bents

End Fills: Earth Fill at End Bents, 3:1

From Bridge Office Date _____

From District Office Date _____

From Design-Builder Date _____

Construction Cost Estimate _____

Date _____

